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*Illustrated.

IN a recent hearing before the Texas Railroad Commission, Earl Mayfield, a member of the commission, but not Chairman Mayfield, attempted to criticize the railroads of Texas for having spent considerable sums of money in large advertisements in the daily newspapers setting forth their side of disputed questions. Apparently from the reports of the hearing E. Mayfield did not have with him even the other members of the Texas commission. Mr. Mayfield's argument was that since all expenses of a railroad are paid for by the public the public should not be called upon to pay for their own education. Mr. Mayfield's criticisms are absurdly wide of the mark. The growing

practice of railroads and of other large public service corporations of turning to the daily newspapers to put before the public in this manner their side of controversies is one of the distinctly wholesome signs of the times. In the first place it shows that the roads must have a sound case if they are to win it by thus appealing to the public as judges. No matter how misleading or clever advertising may be it must in the long run depend for its success on the quality of the goods advertised, and the same is true of the arguments in a controversy. Furthermore it is a recognition of a fair public opinion which is willing to hear both sides. This is a long step away from the attitude taken by some of the older schools of railroad men who contemptuously dismissed any efforts to appeal to the better class of public sentiment through a policy of frankness by expressing the opinion that the general public were both too ignorant and too lazy to try to form a just opinion; and that it was cheaper to bribe legislators than it was to pay for advertising. If a railroad manager sits down and tries to write out a half-page advertisement setting forth his side of a controversy he is pretty likely to learn a great many things about the other side of the question that never would have come to his notice in the ordinary course of events. Furthermore, as he strengthens his case on paper, he unconsciously looks for and corrects mistakes in management that have helped to lead to the very state of public opinion which he is trying to change. In this connection the address of President Finley reprinted elsewhere in this issue is of especial interest.

IN the *Railway Age Gazette* of June 20 we commented at some length on bulletins commending employees, and in the issue of July 11 in an article entitled "Merits and Demerits," published a list consisting entirely of records of discipline administered. For about two years the Pennsylvania Railroad has been issuing monthly bulletins showing commendations as well as cases of discipline relating to employees. In another column there are reprinted the commendations for a single month for one division—not grand division—and also certain selected cases from the discipline administered. An employee who has performed a commendatory act receives a letter of commendation signed by the superintendent, so that he has something of record to show in the future should he come up for discipline. Such commendation is considered as an offset in administering discipline and mitigates, or may even eliminate, the serving of the discipline, although the employee's record is shown charged with the full discipline to which he was liable. There are some points of especial interest about the list which we publish. In the comments in these columns on "Commending Employees" it was pointed out that there ought to be some distinction between an employee who does good work in the line of his duty and one who goes outside of his duty to further the interests of his company. In the bulletin which we reprint commendation in most cases is given only where an employee has gone outside of his duty to further the interests of the company; and in cases, as, for instance, where an engineman and fireman were commended for keeping an engine in a clean condition, we may assume from the common sense spirit that is maintained in both the commendation and discipline that commendation in this case was given because of the *unusually* good performance of duty. The cases of discipline selected were taken because they show a certain courage that is rarer than it should be in the administration of discipline on matters that are of real importance. It is so easy for a superintendent or trainman to shut his eyes to a freight flagman throwing refuse on the ground, instead of putting it in a garbage can, or to a brakeman allowing a passenger to board a train in error, simply by persuading himself that all he can be responsible for are the results in the matter of handling business that are obtained by the employees on his division.

IN 1864, the main line of the East Indian Railway was open from Calcutta to Delhi, 1,020 miles, with the single exception of a break at the ferry where the Jumma bridge at Allahabad was still unfinished. The chairman of the board of directors said at the time that not even the Grand Trunk of Canada could compare with it in length of line. Although this statement was incorrect the Grand Trunk was the only railway which did have a greater mileage, for there was not a single company in the United States which could equal it. On June 30, 1864, the Grand Trunk was operating 1,335 miles of line, and the railways with the greatest mileage in the United States were the New York Central & Hudson River, with 804 miles, and the Pennsylvania Railroad with 797 miles. On June 30, 1865, the Chicago & North Western had 847 miles of line in operation. At first thought one would scarcely expect to find a railway with such a large mileage in India at that time, but it is not so surprising, for nowhere else were the conditions so favorable or the incentives so strong. The East Indian Railway was backed by the Honorable East India Company, one of the richest and most powerful organizations in existence. The territory penetrated was exceedingly fertile and the density of the population was greater than in any other region then being opened up by railways. The country was flat and offered few difficulties to construction, and labor was plentiful and cheap. England was trying to civilize a very backward nation, and the great value of railways as a civilizing force was appreciated even then. Moreover, England had suffered severely from the lack of railways during the Sepoy rebellion, seven years before, and was determined to profit by that lesson. The conditions in the United States were very different. The population was dense only in widely separated localities. It was growing rapidly, but in such a way that the railways found it profitable only to serve restricted districts. The total mileage in operation in the United States in 1864 was 33,908, doubtless greater than in any other country, but this was divided up among a very large number of companies. Until that time no company had risked connecting very distant communities on account of the comparative dearth of traffic that would have existed throughout a large part of the territory traversed. Also, the country had been in the throes of the Civil War, which had greatly reduced the supply of money and labor, and had consequently materially retarded railway development. Canada, on the other hand, had not been handicapped in this manner and could afford to build long stretches of line, invading American territory to secure the traffic, which, in a large measure, would have gone to American railways had the conditions been otherwise. At that time, therefore, although the United States had the greatest railway mileage in the world, either of two foreign companies could boast of greater mileage than any single company in this country.

A WIDESPREAD controversy, in which many varying opinions have been expressed, has been aroused by a ruling issued by the Interstate Commerce Commission in May that carriers may be permitted to charge for copies of their tariffs, not to exceed the cost of the paper, extra printing and mailing. The commission announced the opinion that it is discriminatory to furnish tariffs free to some shippers or associations unless the privilege is accorded to all, and held that if tariffs were to be charged for the carriers must publish price lists and furnish enough copies to meet the demand. On June 16 Agent Leland of the Southwestern Lines issued a price list of tariffs, to become effective July 1, but the date has since been postponed at the request of shippers to October 1. The entire matter involves some perplexing questions. Shippers naturally take the position that tariffs are the railways' price lists, analogous to the catalogs issued by business houses, and that they should be furnished free to all who ask for them. Under the law shippers are required to be informed as to the correct rates and have the right to request quotations in writing. The railways are also required to publish tariffs and post them publicly at stations,

subject to the commission's orders. This creates a situation slightly different from that of other kinds of business, that are not subject to regulation and are free to publish or not publish price lists and to issue or deny them to whom they please. Moreover, there are cases in which business houses that publish very elaborate and costly catalogs do impose a nominal charge for them to avoid the waste of allowing them to fall into the hands of people who would make no use of them. One of the principal arguments advanced by those in favor of charging for tariffs is the large waste now involved in issuing expensive tariffs to those who have little or no use for them, and while carriers may undoubtedly reduce this by more frequent revising of their mailing lists it is difficult to see how a large waste can be avoided if they are required to furnish tariffs indiscriminately to all who ask. On behalf of the shippers it has been urged that if the shippers of the country should to any extent decline to pay for tariffs and call upon the carriers to quote rates the extra expense in clerical hire to meet the demand would easily exceed the cost of tariffs, and that shippers are now making use of their tariffs to perform a great deal of service for the railways. The shippers, however, are not looking up their own rates for the benefit of the railways, but because it is to their own interest to do so. The publication and posting of tariffs under the requirements of the law have added a very considerable sum to the expenses of the railways which must be paid by the public in some form or another. It would seem to be only equitable to distribute a part of this cost among those for whose requirements it is incurred.

AMERICAN SOCIETY FOR TESTING MATERIALS.

AT the annual meeting of the American Society for Testing Materials, which was held at Atlantic City recently, there were presented the usual large number of papers and reports some of which were of high scientific and commercial value, while a justification for their presentation would be difficult to find for others. The society labors under the same disadvantage that handicaps all technical associations of a broad and general character. Its interests are so wide and so diversified, covering as they do the whole general subject of scientific investigation, that it is impossible to obtain a discussion that is really worthy of the name on any one subject. Hence papers are presented that receive such scant attention as to be discouraging to their authors. Then, too, the very fact that the standing of the society is high and the work that it has done is valuable, attracts papers that ought not to be accepted from men who have little or no notion of what a scientific investigation really means. They have made a few tests, limited in scope, possibly for a specific purpose, and then they proceed to prepare an elaborate paper giving minute details that are of no value and from which no conclusion or recommendation can be or is drawn. In fact one of the crying weaknesses of the society is that so many papers are written that lead nowhere and tell nothing and serve no recognizable purpose other than that of placing the names of the authors for a few brief moments before the association, to be at once forgotten, unless the effort happens to be particularly bad, as happens occasionally, when it would have been better had the effort not been made.

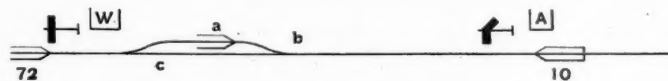
These are weaknesses that can probably be remedied, though it is difficult to say just how. A reading committee that could pass intelligently on all papers offered would have to be a complete compendium of human knowledge, and such a committee would, of course, be impossible to procure. Still it does seem that a censorship somewhat more rigid than that apparently exercised would be well.

The specifications adopted by the association are of a high and ranking character, though they sometimes fail to fully grasp the requirements and ideas of consumers in every particular. But they are usually drawn by specialists who work long and earnestly and represent the best practice. It is for this reason,

as well as because of the generally diversified character of the membership, that there was much force in the secretary's plea that no changes should be made in the open meeting, in proposed specifications. His claim was that the membership was not qualified to make changes, and that the most that should be done would be to refer back to the committee for reconsideration. This holds, too, for the final adoption of specifications by letter ballot. It is safe to say that the great majority of the members are incapable of voting intelligently on any one set of specifications. For example, what does the steel manufacturer know about the qualities of linseed oil, or what moral right has the chemist of a paint manufacturer to cast a vote on steel rails, and yet this is exactly what a letter ballot of the society invites. Hence, it is well to regard its specifications as the output of committees of specialists, and, as such, entitled to the corresponding amount of respect and confidence, sanctioned by the society at large because its members have seen fit to pass what amounts to a vote of confidence in the formulating committees.

WORKING THE SPACE INTERVAL SYSTEM WITH INADEQUATE SIGNALS.

A CORRESPONDENT wants to know what is the safest and best practice in manual block signaling in a situation like that illustrated in the sketch shown below. The scene is on a prominent eastern road. Extra train No. 72, going south, at W is obliged to wait there for regular train No. 10, going north, which is at A. The despatcher issued an order for the trains to meet at W and then, to save time, issued a second order to Extra 72 authorizing it to pass the signal at W under full



flag protection, so that it could be clear of the main track in season to cause a minimum delay to No. 10. "On approaching W No. 10 was flagged, the other train, with its engine at a, not having got in to clear.

The principal point at issue, concerning which our correspondent appears to have had some controversy with his superior officer, is whether it was proper to give to No. 10 (as was done) a clear signal at A. The operator at A received from W a "clear block"; that is to say, authority for No. 10 to run to the signal at W. This signal was beyond the switch at which the Extra had to enter the side track; but the meeting order had the effect of ordering No. 10 to stop before it had reached this switch.

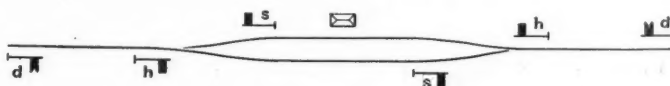
We print this statement and question, not because we propose to sit as a judge in the controversy, but rather as an illustration of the difficulty of managing the block system without a suitable equipment of fixed signals. The patchwork by which two or three different rules, in different parts of the code, are depended on for the safety of two simple train movements, is no worse patchwork than will be found in many other situations, and is not so bad as will be seen every day in many places; but it remains patchwork, and is tolerable only because much time and money would be required to change bad practice to good.

The despatcher in this case provided a double protection; and therein felt, no doubt, that he had taken all necessary precaution. Proper obedience to the meeting order required No. 10 to stop at c; that was one protection; and the flag, stopping the train at b, was another. To give a stop indication by semaphore at A, the same being modified by the meeting order, would have been another. With the use of this last provision the flagging might have been omitted. Whether this would have been better may depend on a number of circumstances. If the time consumed between A and W was considerable, the chance of forgetting the signal indication would be an element. The practice of setting signals at stop and then issuing written orders which

contradict the signal indication is to be deprecated, for it tends to weaken the signal system. Every thoughtful railroad officer desires to make of signaling an exact science; this practice thwarts that purpose. But dependence on the flagman also has its difficulties, and we shall not quarrel with the man who tries to make a train movement safe without the flagman. Dependence solely on the rule which would have required No. 10 to stop at c, involves complete confidence in the examiner who has educated the engineman in obedience to rules; so here is another difficulty. No examiner that we know of has been able to bring every one of his enginemen up to 100 per cent., even on paper.

Having all these factors to consider, with their admitted perplexities, why not adopt the brief rule that all trains shall approach all stations under control? This would be simple. Admittedly, it would have to be very rigid. But it could be safely modified, in the case of important express trains, by giving written orders conferring unlimited right from Station A to Station C (ignoring the signals at Station B); and with adequate care it might be all right to give such an order by signal instead of on paper. This under-control rule would arouse instant rebellion, all around, without doubt. But so did the block system, at first. But if adopted it would have great educational value and it would enforce the lesson that there ought to be adequate home, starting and distant signals at every station. With these facilities at W and A the despatchers, trainmen and others who disagreed in this case would have been freed from their perplexities, and they would have been able to sleep soundly at night.

In Ireland, Australia, Japan and certain other countries which in some respects are more enlightened than America, the progressive railroad manager is not satisfied, at single-track meeting points, with anything less than a symmetrical loop; that is to say, meeting tracks so laid that trains from both directions



can run fully up to the station before encroaching on the rights of trains from the opposite direction. This simple arrangement is shown in the sketch above.

NEW BOOKS.

The Steam Consumption of Locomotive Engines from the Indicator Diagrams. By J. Paul Clayton. Bulletin No. 65 of the University of Illinois Engineering Experiment Station. Copies may be obtained upon application to W. F. M. Goss, Director of the Engineering Experiment Station, University of Illinois, Urbana, Illinois.

This bulletin applies to locomotive engines the logarithmic analysis developed in bulletin No. 58 of the engineering experiment station by the same author. In bulletin No. 58 it was shown that the expansion curves of all steam engine indicator diagrams obey substantially the polytropic law $P V^n = C$, and that the value of n is controlled directly by the quality of the steam mixture in the cylinder at cut-off. It was further shown that each distinct type of engine possesses a series of definite relations between the values of n and steam quality at cut-off, and that, by determining their relations, the actual steam consumption of engines can be closely determined from the indicator diagrams alone. This present bulletin gives the relations of n and steam quality at cut-off as determined from the tests of twelve locomotives, and shows that the steam consumption of these locomotives may be determined by this means to within 4 per cent. of the steam consumption as measured on test plants. Methods are developed for measuring valve leakage, the proportion of steam used for heating the train in winter, the spring in valve gears, cylinder clearance, cylinder leakage, and the cyclic events.

Letters to the Editor.

BOILER TUBE SPECIFICATIONS.

PHILADELPHIA, Pa., June 21, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I beg to call your attention to an item on page 1369 of the *Daily Railway Age Gazette* of June 14, in which criticism is made of the American Society for Testing Materials committee for not keeping in touch with the Master Mechanics' Association committee. Whoever wrote this item was certainly not aware of the facts, because as chairman of the A. S. T. M. committee I have been in constant correspondence with Mr. Henry, the chairman of the Master Mechanics' Association committee and, in fact, the A. S. T. M. committee had a representative present at one or two of the Master Mechanics' Association committee meetings. The proposed specifications have been frequently interchanged and harmonized the one with the other, and they now almost agree exactly, with the exception of one or two minor modifications which were introduced in the Master Mechanics' committee after the A. S. T. M. committee suggestions had been approved by the meeting of that society; it is the intention as soon as these specifications are approved by a vote of the Master Mechanics' Association to harmonize the two absolutely. They would have agreed had not the Master Mechanics' committee made some alterations after the A. S. T. M. specifications and the Master Mechanics had been brought together, it was thought, finally.

G. R. HENDERSON.

PULVERIZED FUEL FOR LOCOMOTIVES.

ALTOONA, Pa., July 21, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Since the publication of my article on "Powdered Fuel for Locomotives," *Railway Age Gazette*, July 4, I have been quite severely criticized by one or two engineers who say my article is "too previous—that what I claim, I have done on paper only and that I have no facts or proof to back up my assertions." Every engineering feat of any importance was done on paper first; hundreds of successful inventions and devices have been made successful by studying and profiting by the mistakes of others.

True, a Scotch marine boiler on a locomotive is revolutionary—so were steam turbines on our biggest ocean liners. Oil is being successfully used on locomotives—why not powdered coal? Oil is practically a gas, as it ignites—so is coal. Although powdered coal is in form a gas, it is far different from oil at the point of ignition. The most perfect nozzle or spray for oil yet devised cannot begin to approach in its fineness of mixture the fineness of powdered coal; it cannot begin to approach the perfect intermixture of air and coal which is possible with powdered coal. It has been shown that a big percentage of it is so fine and light as to remain in suspension in the air when allowed to escape. Will oil do this? Gasolene is admitted to be much more volatile than kerosene, and much more still than fuel oil, as used in furnaces, yet even the most expensive carbureters built, after years of experience, have been shown to be inefficient in mixing the gasolene and air, by simply inserting an additional air mixing device in the manifold to still further break up these small particles of gasolene.

In all the attempts to fire powdered coal on locomotives in the past practically every one was conducted and tried along lines similar to those used with oil, and just as long as this system is carried out failure will be the reward. Powdered coal is as different from crude fuel oil as the highest test naphtha. Why engineers and other experimenters have not realized and benefited by this I cannot comprehend, and until they do they may as well try to develop perpetual motion.

Powdered coal can be burned economically in a locomotive, perhaps not as efficiently as on one especially designed for its use, but well enough to prove its worth as a successful fuel. Give me the biggest Mallet, a pulverizer, fan and all the material necessary for the work, and in forty-eight working hours I can equip it ready to run on the road with powdered coal as fuel. This can be done without altering the boiler in any respect whatever, the only changes being minor ones in the firebox and tender. Though it costs roughly about thirty cents a ton to dry and pulverize the coal, I will guarantee to show at the end of a day or week's run a saving on the credit side of the ledger. Of course, as I said, this would not be as efficient as a boiler specially designed for it, yet it would prove cheaper than the most efficient superheater.

One reason that this is so is because every pound of coal burned is doing work; you are not wasting several tons a day keeping up steam in roundhouses, standing on sidings, waiting for orders, etc. There is no wood needed to start fires, no ashes to clean out, no fires to knock out. Why? Because a powdered coal flame—once the firebox is heated—can be turned off and relighted as readily as gas. If a train has to stand five minutes in a station the flame is cut off entirely. It isn't necessary to baby and rake and shake a fire prior to taking a long grade, it is as easy to increase the heat as it is to open the throttle. Think what this means alone. The abolishing of steam failures. At a test several years ago when they still had steam engines on the Manhattan Elevated an engine equipped to burn powdered coal ran all the way to Harlem and back with the boiler heated simply by the fire brick—the flame being shut off entirely. Their boiler was a success but their method of firing was not.

Tradition and past performances are hard things to fight, and many an inventor has gone down to discouragement simply because he had something which others had tried and said couldn't be done.

WALTER D. WOOD.

CIRCULATION IN FIREBOX WATER LEGS.

ALTOONA, Pa., July 21, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In the *Railway Age Gazette* of July 18, page 91, you had an article, supplemented by drawings purporting to show the direction of circulation of the water in the legs of a firebox, the device used for the experiment being a glass tube bent in different forms to represent a section. This would do all very well for a class room experiment, but it does not at all comply with conditions as they are in the firebox.

If the space between the inner and outer walls of the firebox were subdivided by solid plates, such as *AB-CD*, etc., as I have shown in Fig. 2, permitting of no circulation between *X* and *Y*. *Y* and *Z*, etc., then the conditions would be the same as in the tube experiment. As it is, it is not unreasonable to suppose that the comparatively colder water along the bottom of the barrel of the boiler will take the course shown by the arrows in Fig. 1, flowing in to fill the place vacated by the water rising along the sides of the water legs. A few sensitive pyrometers might help to prove this. If the author of the article had had a series of tubes connected at top and bottom he would have been nearer to the solution, but still far from it.

WALTER D. WOOD.

PROJECTED LINE IN KWANGTUNG, CHINA.—For some time there have been discussions as to the necessity of joining the populous town of Tsang Shing on the East river with the main line between Canton and Kowloon. It will attach itself to the main line at Shek Lung. It will not be a long line, only about 14 miles. On the other hand, it will pass through two or three large towns. The promoters affirm that the way is level and that land can be purchased cheaply. The same company has also suggested other lines, joining the towns in the district north of the East river.

GETTING MORE MOVEMENT FOR FREIGHT CARS.

Delays at Terminals Present the Hardest Problem—Suggestions Regarding Some Means for Overcoming Such Delays.

By ARTHUR HALE,

General Agent, American Railway Association.

The meager car surpluses remind us that there may be a car shortage earlier than ever this fall. The surplus on June 30 was no greater than it was on the 1st of February, and was just what it was a year ago. Let us consider what should be done to avoid, postpone or minimize the car shortage which may be waiting for us next October.

First, then, let us ask what is a car shortage. Is it necessarily a lack of cars? The answer to this, of course, is "No." We have enough cars if we can move them faster. To avoid a car shortage, then, we need either more cars or more movement, and it will be better if we can have both more cars and more movement.

As to the cars, the answer is easy. Last year the roads built 150,000 new freight cars, and this year they are nearly 10,000 cars ahead of their last year's record. Something is being done in this line.

Now, how about movement?

What do we mean when we say the movement can be improved? Do we mean that our freight trains ought to be run faster? Any railroad man will tell you "No"—that to run freight trains faster is not the best way to secure a better movement. He will explain that the freight car is in motion only a small fraction of the time, and that what is needed is more movement of the kind we have now, and not faster movement.

The latest average movement that the Interstate Commerce Commission has given us, which is for the fiscal year 1910, was 24 miles a day. The maximum movement reported to the American Railway Association by its members was for October and November, 1912, when the movement reached 26 miles per day.

The usual arrangement with train employees is that they are to be paid overtime when the freight train makes less than 10 miles an hour. This 10 miles an hour is generally accepted as a proper movement for a freight car. At this rate our freight cars in the fiscal year 1910 were in motion one-tenth of the time, and in our record months they were in motion about one-ninth of the time. Certainly, there is a chance for more movement of a vehicle which stands still eight hours for every hour it is in motion.

These are the recognized statistics, but it is perhaps a pity that the railways should put their worst foot forward by acknowledging this record of 24, or even 26 miles per car per day.

It is not generally understood that this gives only the road movement of a car and omits all switching mileage, nor is it well understood that a car is necessarily switched a great many times in each of its round trips, and that each of these switch movements necessarily takes a good deal of time. It is, however, too late to change this basic figure. It is about the only thing we have as a basis of comparison on this question, so we will let it go.

Let us consider who is responsible for car delay. This responsibility is divided between the public and the railroad. Delay by shipper and receiver should be adequately taken care of by demurrage rules, and there is a general impression that on the whole there is less delay by the public than there used to be. Unfortunately, there are no statistics by which this can be proven. The only information which covers the whole of the country is a figure given by the Interstate Commerce Commission of \$7,764,964 demurrage collected by the railways in the fiscal year 1911. The commission will give us this fig-

ure for 1912, and for future years, but we have no figure covering the whole country prior to this one for 1911. We have, to be sure, the statistics of certain demurrage bureaus showing delay by shippers or receivers, but these figures are not made on a uniform basis, nor do they cover the whole country. We cannot, therefore, tell how much the shippers and receivers should help us, but we shall know more on this point in the future. Certainly, some of the shippers and receivers made great efforts to secure prompt handling of cars during the car shortage last fall and winter, and we trust they will continue these efforts even more successfully this year.

Now, as to delay by railroads, and in this delay I will include shifting movements. As stated above, the railways do not credit themselves with any mileage on account of these shifting movements, and usually the time occupied in a switch movement is much less than the time in which a car stands awaiting such a movement. Delays by railroads appear to be divided into four kinds—delays en route, delays in yards, delays in shops, and delays in storage, and by this last word "storage" I mean the holding of all available cars for which there is no immediate prospective loading.

Delay en route is something the railways know all about, or can know all about if they want to. It is indicated very clearly and cogently by the overtime which is paid train crews. Further than keeping overtime to a minimum, it is generally agreed that delay en route need not be considered.

Delay in storage is not usually an important matter in the periods of car shortage, because in such periods there are no cars stored, and there ought to be no cars stored. If, in exceptional cases, cars are stored in periods of car shortages steps should certainly be taken to turn the cars over to roads which need them.

Delay in shops is also a matter on which the railways are fully informed. This subject was treated in an article published in the *Railway Age Gazette* of July 11, 1913, which shows the necessity of repairing cars now. It is gratifying to observe that the corner has been turned this year earlier than usual. The per cent. of cars in shops appears to have reached its maximum on May 31, and an improvement is shown as of June 14.

The bulk of delay in periods of shortage is to cars standing in yards awaiting movement. This includes both loaded and empty cars. There are cars delayed in this way waiting to go into shops and coming out of shops; cars awaiting delivery to connections, and awaiting movement from interchange tracks, and lastly, and this is probably the most important item, there is a great total of cars, loaded and empty, awaiting road movement, some in terminals and others in yards where engines are changed.

L. F. Loree, in a recent article in the *Engineering Magazine*, estimates the average delay to cars awaiting such movement as 10 hours and 32 minutes. This was on the basis of the average movement of the year 1910. Last fall, when a record movement of 26 miles a day was made, this "yard delay" appears to have been reduced to 8 hours and 16 minutes, and even this seems too large. Some roads brought this average delay down to 4 or 5 hours, and these are the roads which have made the best record in moving cars and in moving freight.

The problem for the transportation departments of the country, then, during the next car shortage is to reduce the delay to cars in yards.

It is hard to believe that the average freight car on an aver-

age railroad stands still for 10, or even 8 hours, when it is all ready to go somewhere. Probably the average car does not wait as long as this for road movement, and the greater delays are in the local movement.

For instance, on large railroads cars are arriving at large terminals at all hours of the day and night. There is often only one shift a day to certain private sidings. If a car for such a private siding does not reach the terminal in time for this shift it has to lie over 24 hours. To this delay Sundays and holidays are to be added. In such cases the average delay is well over 12 hours and this delay cannot be reduced unless two shifts a day are given. This is typical of all cases where cars may arrive at a point at any hour in the 24 for connection with any local movement which is made only once every 24 hours.

Cars are sometimes held for "solid trains" longer than is intended, and cars may be held for quite considerable periods on account of one error or another on the part of the railroad or the shipper. All these delays are, of course, entirely outside of the regular "free time" allowed the roads' patrons for loading, unloading, inspection, reconsignment, etc.

But even if these extreme cases are cut out, the delay in yards awaiting road movement is often longer than is fully appreciated. Many a railroad manager is perfectly content when he looks over his reports in the morning and finds that while in the previous 24 hours there were, say, 5,000 cars "moved," there were only 2,500 "left in the yards." If he is content with such a showing he does not realize that this indicates an average delay of 12 hours to every car.

To be sure, it is unsafe to generalize from the cars "left over" at any one particular hour, but if this midnight figure of 2,500 cars represents the average number, the generalization is correct, and it is very easy to judge from a comparison with reports of other hours or dates whether or not an average condition is reported.

The first thing to do to get more movement for our freight cars is, then, to reduce this yard delay, which means to reduce the number of cars left in yards; and the best way to do this is to bring the facts home to everyone concerned, that is, to everyone who can help; and it is really surprising to find, when you analyze the situation on a large railroad, how many of the officers and employees can help to reduce the number of cars in yards. The superintendents, trainmasters, and yardmasters, the men who are directly responsible, are sometimes the only men who have information on the subject, but there are a great many others who can help, and will help, if the importance of the matter is explained to them. Every yard clerk can help, and a great many will if they are told exactly what is needed. The master mechanic, roundhouse foreman, and men about the roundhouse can help a great deal, and they will help if they realize that it is essential to their railroad and the railroads at large that more movement be given to freight cars. Maintenance people can help a little, and the traffic people can help a great deal. Often the president of a railroad can, and will, help if he is shown how little movement can be given to freight cars under present facilities and organization, and how much more movement can be given with improved facilities and organization.

But in distributing this information, and explaining it, we must be sure that it is information and not misinformation. As already indicated, many managers are satisfied with average conditions because they do not know exactly what their reports mean. It is easy, as I have indicated, to ascertain the approximate delay to cars from the reports which are currently made, but it is a very laborious and difficult task on a large railroad to show actually the average delay to all the cars passing through a given yard on a given day. Still, this is something which can be figured out in the card record office, and often it has to be figured out before the men responsible for the movement can believe that the average delay is anything like what is indicated by the reports of the movement and of

cars left over. Sometimes it is easier to convince the man on the ground of the delay which is taking place in his yard by making the yard clerks check against each other the hour of arrival and the hour of departure of each car. Sometimes it is necessary to do this both in the yard office and in the car record office before those responsible are convinced of the situation.

Besides convincing ourselves of what our current reports show, we should be very careful to make sure that these reports fully cover the situation, and this requires constant vigilance. It is a great temptation to everyone to make a favorable report of his own work, and it is so easy for a man on the ground to forget to report a few cars here or there, that it is really necessary to check up all car reports.

There are various ways of doing this. The car record office is useful, and so are regular trips of inspectors, but nothing is more effectual in the way of getting correct reports than for the officers to make it plain in their trips over the roads that they frequently consult and act upon the reports of cars on hand and of cars forwarded.

One special point must be looked after by the management, and this is that there be no confusion as to responsibility for car reports. It should be definitely decided exactly who is to make the car report for each siding. There is sometimes a question whether the agent, the yardmaster, or the master mechanic should make this report, and this is a question which should be gone over periodically so as to make sure, in changes of clerks, that no siding is missed, and the daily report is made complete. This may sometimes involve a decision as to whether cars awaiting movement to shop are to be counted as shop cars or not. Unless such points are fully decided some cars may not get reported at all, and on the other hand, an undue zeal may lead to duplication.

Points of interchange must be looked after especially, and the daily report of cars on hand should show the cars standing on interchange tracks for movement by the home road. A supplementary report should be made of all cars standing on interchange tracks for foreign roads, with the number of cars moved away each day. If this precaution is neglected there is danger of an unexpected accumulation or congestion. It is desirable to check these reports of cars on interchange tracks periodically with connecting roads. When this is regularly done many misunderstandings at junction points are avoided.

It is useful to have the card waybills stamped with the hour of arrival in every yard. By this device the delay to every loaded car in the yard can be readily ascertained by an inspection of the card waybills in the yard office.

Special precautions, also, should be taken to prevent delay to empty cars even in times of car shortage, as local shippers and agents are always anxious to hold a few cars for prospective loading.

It is a mistake to unduly elaborate records and statistics. The reports ordinarily in use on American railways are sufficient to give information as to the situation if they are fully and correctly made up and properly understood. After this it becomes a question of organization and discipline.

There is one other matter, however, which cannot be neglected if we are to have more movement for our freight cars. The roads must have plenty of freight engines, and the engines must be in good repair. It must be understood that a train of cars, even of empty cars, is worth more than an engine, and its delay costs more than the delay to an engine. Cars, therefore, should not wait for engines, but engines should always be ready when a train is ready.

EARNINGS OF SOUTH MANCHURIA RAILWAY.—The annual meeting of the South Manchuria Railway was held at Tokyo on June 14. During the fiscal year ended March 31, 1913, the company's gross revenue amounted to \$16,705,900 and expenditures to \$14,252,800, increases of \$2,684,600 and \$2,057,900 respectively over the previous year.

HOWARD ELLIOTT.

Howard Elliott, president of the Northern Pacific, on July 25 was elected president and director of the New York, New Haven & Hartford, as the selection of the special committee of directors appointed to choose a successor to Charles S. Mellen. The election becomes effective on September 1, but it is announced that at a meeting of the directors some time in October it is proposed to make a change in the by-laws of the company, under which Mr. Elliott will be elected chairman of the board of the entire New Haven system, and that each of the principal constituents of the system, the New York, New Haven & Hartford, the Boston & Maine, the New England Navigation Company, and the trolley line system, will have individual presidents. The new administrative plan conforms with recommendations of a committee of stockholders headed by George von L. Meyer. In becoming president of the New Haven, Mr. Elliott for the second time follows in Mr. Mellen's footsteps, having succeeded him as president of the Northern Pacific in 1903, when Mr. Mellen left that road to go to the New Haven.

Mr. Elliott seems to be an excellent choice for dealing with the very difficult railway situation in New England. He is a native of the East, having been born in New York City. While his railway career has been spent on western lines, he will find himself perfectly at home in New England, for he received his education at Harvard University, having graduated from the Lawrence Scientific School in 1881 with the degree of C. E. One of the things that got Mr. Mellen into trouble was his undiplomatic way of talking to and dealing with people. His biting sarcasm and disregard for other people's feelings and opinions made him innumerable enemies. Mr. Elliott is so differently constituted that he would be incapable of making enemies in this way, either for himself or for a railway that he was managing. He is naturally reserved, but, in spite of this, has made a practice in recent years of delivering numerous public addresses on railway subjects. In his personal relations with patrons of the road and in his public addresses he has been moderate, conciliatory and patient. He is an extremely sincere and earnest man, who leaves this impression on all with whom he comes in contact, whether in a business way or otherwise, and it seems to be a safe prediction that he will very soon win the regard and complete confidence of the people of New England both by what he says and by what he does. He accepts unreservedly the modern principle that railways and their officers are public servants, and tries to live up to this theory both in his utterances and in his management.

As a railway executive, he is one of the leaders of the country. He learned the business on the Burlington, from which so many able and successful railway managers have been graduated. He has served at different times in the engineer-

ing, the accounting, the traffic and the operating departments, and few men know both the theory and practice of railway operation and management so thoroughly. He is a tireless worker, a master of details, and an excellent organizer. He makes his plans far ahead, and is indomitably persevering in carrying them out. He has had a difficult situation to deal with throughout his career on the Northern Pacific. The road when he took charge of it was not in very good physical condition, and he very greatly improved it. Its mileage was 5,111 miles, and he increased it to 6,032 miles. Its revenue freight train load was 326 tons, and he increased it in 1912 to 511 tons. It looked as if the Northern Pacific was hard hit when the Chicago, Milwaukee & St. Paul built its extension to Puget Sound right through the Northern Pacific territory, and the Northern Pacific did feel severely for some time the effects of this new competition, but Mr. Elliott sturdily met the issue, fought a

good fight, maintained the road's dividend, and at the same time made large expenditures from earnings for improvements. In spite of the adverse conditions he was able to show a surplus of over \$3,000,000 in 1911, and one of over \$2,000,000 in 1912. When George J. Gould retired as president of the Missouri Pacific in 1911 Mr. Elliott was offered the presidency of that road, but declined it.

The foregoing indicates in a very inadequate way the manner of man who has now been given the task of solving the New England railway problem. If the owners of the New England railroads and the people of New England will give him a fair chance Mr. Elliott will do a great work for them, and his personality and his methods are such that it would seem they should command the respect and support of both the owners and the patrons of these railways.

Mr. Elliott has always taken active part in the social and business life of the cities in which he has resided, and has also by acting in co-operation with various organizations, aided in the conservation movement, and materially forwarded the agricultural interests of the West.

He was born December 6, 1860, in New York, and entered railway service during the summer of 1880, during his college vacation, as a rodman on the Chicago, Burlington & Quincy. After his graduation from Lawrence Scientific School in 1881, he became, on October 17, clerk in the president's office of the St. Louis, Keokuk & Northwestern, and during the following year for several months was clerk in the assistant treasurer's office of that road at Keokuk. From September 15, 1882, to January 1, 1887, he was assistant auditor and assistant treasurer of the Chicago, Burlington & Kansas City and the St. Louis, Keokuk & Northwestern at Keokuk. From January 1, 1887, to May 1, 1891, he was general freight and passenger agent of the same roads, and from the latter date to January 1, 1896, also of the Hannibal & St. Joseph and Kansas City, St. Joseph & Council Bluffs. From January 1, 1896, to May 1, 1902, he



Howard Elliott.

was general manager of the same roads, and from May 1, 1902, to October 21, 1903, second vice-president of the Chicago, Burlington & Quincy. On the latter date he was elected president of the Northern Pacific, and he is also president of various subsidiary companies of the Northern Pacific.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.

The first two sessions of the fifth annual convention of the American Railway Tool Foremen's Association were reported in last week's issue, page 158. Following is a report of the last session of the convention:

FORGING MACHINE DIES.

B. Henrikson, Chicago & North Western, Chicago, Ill., chairman of the committee, in discussing the best material from which to make the dies, stated that cast iron, being the cheapest material and most easily worked, is very desirable for dies, but can only be used where the demand for its product is not very great. Where many forgings are required the dies should be made of cast steel. In cases where more wear takes place on one part of the die than on another the main body may be made of cast iron with a steel insert for the place where the excessive wear comes. These inserts may be replaced when worn beyond a certain limit. Nickel steel is used for heavy plunger work, while common tool steel or special plunger steel will do for lighter work. Care should be taken that the design of the dies allows for the overflow of the excess metal.

Charles Helm, Chicago, Milwaukee & St. Paul, Milwaukee, Wis., also a member of the committee, exhibited drawings of dies used on a 4 in. Ajax forging machine for forging castle nuts.

Discussion.—It would seem that the opportunities of the forging machine were practically unlimited, as with a good die maker many of the articles that are now made by hand in the smith shop may be more easily and less expensively made on a forging machine. The constant study of methods in the various shops will present an opportunity for the tool foremen to greatly reduce the shop operating expenses by designing tools for doing special work. Many of the members are using tire steel for the base of dies with tool steel inserts for the parts that receive the worst treatment. Cast iron is also used with steel inserts with considerable success. As a general proposition it seemed that it was not economical to use a high grade of steel in the dies, as the difference in the service between it and the cheaper steel does not warrant its use. Nickel steel was mentioned by many as giving good results for plungers and inserts. While high speed steel has also been used for this purpose it was found that it will not give service where water is used for cooling; when water is not used it will give excellent results, especially in doing work in which the plunger becomes red hot. A few members spoke of punching the tell-tale holes in the staybolts, but it was stated that this would tend to crystalize the metal in the center and harden it, thereby reducing its ductility and increasing the chance of its breaking. On the Central of Georgia chrome nickel is used for the punches or rams, and an air blast is used to remove the scale rather than a stream of water. This has given very good results.

THREAD AND TAPER FOR BOILER STUDS.

A. M. Roberts, Bessemer & Lake Erie, Greenville, Pa., chairman of the committee, recommended the U. S. standard form of thread for boiler studs and plugs for the following reasons: Convenience of manufacturing the studs, simplicity of application; it will give a steam tight fit from inside to outside; it will allow for a stronger and more durable stud; taps and dies may be maintained better and may be easily duplicated, and the old style of V-thread may be changed to the U. S. standard without difficulty. He also recommended a 1¼ in. taper

in 12 in. for standard mud plugs, and ¾ in. taper for studs.

J. E. Dosser, Southern Railway, Knoxville, Tenn., recommended the U. S. standard form of thread as it gives much greater strength and life to the taps and dies than the old V-thread.

Daniel Freyler, Illinois Central, Memphis, Tenn., recommended the old V-thread as standard for boiler studs and plugs, stating that it gave better holding power in the boiler and that it would adapt itself more readily to slight variations in the angle of the thread and still make a tight joint. He also recommended the ¾ in. taper in 12 in.

H. C. Wilson, Southern Railway, Spencer, N. C., reported in favor of the U. S. standard thread as it does not have the sharp point which has been found to wear away so fast on the old type of V-thread. He also found that the old V-thread form of tap or die soon wears off at the point of the thread, losing its size and form, causing trouble from tight or loose bolts.

W. J. Eddy, inspector of machinery, Rock Island lines, Chicago, recommended U. S. standard thread with ¾ in. taper for plugs and fittings, and 1¼ in. taper for washout plugs. In all cases 12 threads per inch was recommended.

Discussion.—A recommendation was passed as the sense of the association that all boiler fittings be made with a ¾ in. taper and the U. S. standard thread with 12 threads to the inch. This recommendation was adopted after considerable discussion. It was clearly pointed out that with the V-thread the taps were harder to keep in proper condition, and that a good steam tight fit could not be made as easily as with the U. S. standard tap. It was pointed out that the U. S. standard would be more economical and give greater satisfaction. The Whitworth thread was mentioned by many as giving the best satisfaction for the staybolts, but was more difficult to maintain than the U. S. standard thread.

A. R. Davis, of the Central of Georgia, reported that from tests he had found that it took 24 per cent. less power to tap a hole with a U. S. standard tap than with a V-thread tap. He also found in tapping 25 holes that the wear on a V-thread tap was .008 in., while on a U. S. standard tap it was .001¾ in. In another test of 50 holes the V-thread had worn away .011 in., while the U. S. standard had only worn .003 in. A lubricant of lead and oil was used. The condition of the tap holes showed that 20 per cent. of those tapped with the U. S. standard thread was better than those tapped with the V-thread.

OTHER BUSINESS.

The following officers were elected for the ensuing year: President, A. M. Roberts, Bessemer & Lake Erie, Greenville, Pa.; first vice-president, Henry Otto, Atchison, Topeka & Santa Fe, Topeka Kan.; second vice-president, J. J. Sheehan, Norfolk & Western, Roanoke, Va.; third vice-president, E. R. Purchase, Boston & Albany, Springfield, Mass.; secretary-treasurer, A. R. Davis, Central of Georgia, Macon, Ga.; chairman of executive committee, C. A. Shaffer, Illinois Central, Chicago, Ill. The following four men were also elected to the executive committee: J. Martin, Cleveland, Cincinnati, Chicago & St. Louis, Indianapolis, Ind.; O. D. Kinsey, Illinois Central, Chicago, Ill.; C. Helm, Chicago, Milwaukee & St. Paul, Milwaukee, Wis.; A. Williams, Pennsylvania Railroad, Ft. Wayne, Ind. There were 56 members registered.

PROPOSED CHANGSAN-YUSAN RAILWAY, CHINA.—The proposal of the managing director of the Chekiang Railway, to construct the short line connecting Changsan, in Chekiang, and Yusan, in Kiangsi, has received enthusiastic response, and some definite action has been taken toward the carrying out of the project. This line, short though it is, will be a connecting link, greatly needed, between the grand routes of the two provinces to Anhui and northward on the one hand, and to Fukien and Kwangtung on the other hand.

JAMES H. HUSTIS.

Under the plan by which Howard Elliott is to become temporarily president of the New York, New Haven & Hartford until the by-laws of the company can be changed to provide for the office of chairman of the board, James H. Hustis, vice-president of the Boston & Albany, is to become, subject to the approval of the board on November 1, president of the New York, New Haven & Hartford. There is not another man prominent in the railroad field who could take the presidency of the New Haven with so much of the confidence of the New England people already behind him as Mr. Hustis. When in October, 1907, James H. Hustis came to the Boston & Albany as assistant general manager—the title of general manager being retained by the general manager of the New York Central, but the duties on the Boston & Albany devolving on Mr. Hustis—it is not much of an exaggeration to say that the Boston & Albany was a by-word for unsatisfactory service in New England. With patience and honesty that inspired public confidence, and the courage of his convictions that gained from the New York Central management a larger and larger share of the final authority in the management of the Boston & Albany, he has brought the service on the B. & A. up to a standard that is not only satisfactory to New England, but is a model for the rest of the country.

Mr. Hustis is sometimes spoken of as being a blunt man. He is blunt in the sense that he is keen, honest, confident in his own honesty and intolerant of subterfuge. He is also intolerant of shirking the responsibilities which go with authority. An instance that well illustrates this point occurred not so very long ago on the Boston & Albany. An engineman had backed his train off a siding which until a few days before had been connected with another track. The engineman was suspended for a considerable period of time and report was made which in the course of time reached Mr. Hustis showing that the engineman alone was responsible, since he had failed to read the bulletin describing the condition of the siding. Mr. Hustis at once refused to accept this report as complete, and insisted that not only was the engineman at fault, but that a share of the responsibility rested also on the men who should have made sure that the engineman read his bulletin and the switchman who knew of the condition of the track and did not especially warn the engineman and on the officers who had not taken every precaution in their power to see that just such an occurrence as this should not happen.

In cases of complaint where the complaints were addressed to the general manager it is invariably the practice for Mr. Hustis to acknowledge the letter of complaint at once, where possible to explain the occurrence complained of immediately, and whenever the complainant was a resident of Boston, or

likely to be in Boston, he was invited to come into the office and talk the situation over. Naturally in a great majority of cases where this invitation was availed of, the critic was turned into a staunch friend.

Mr. Hustis is a member of the board of directors of the First National Bank of Boston and of the Newton Trust Company, his home town. He is also a member of the Boston Chamber of Commerce. By thus actually entering in personally with the interests of those served by his road he has identified himself with the interests of New England, not as an outsider, nor even as an acquaintance, but as a friend.

It seems peculiarly fortunate, or possibly we may lay it to the genius of doing the right thing that seems to attach to Mr. Vail, that the New Haven directors were able to secure in one and the same man qualities which will go so far toward restoring a proper feeling between the New Haven and the New

England people, and qualities which are so badly needed in the New Haven labor situation. Mr. Hustis is a strict disciplinarian, and one of his early decisions on the Boston & Albany was to discharge an employee who had merited such discipline, but who happened to be the leader of one of the strongest labor unions on the road, and in spite of this, or possibly because of it, he has gained to an unusual degree the sincere respect of his men as well as his subordinate officers.

Combined with his inflexibility in the face of breaches of discipline, he has a broad, human toleration for other people's ways of doing things. In commenting on the work of a superintendent, once, who had been in the habit of doing things his own way, and his own way was not always the best way, Mr. Hustis remarked that as he had more and more experience in the handling of men, he had come to the conclusion that the line which divides right and wrong for each individual is not a straight line, rigid and unbendable, but is a line which is balanced with deviations on one side, counterweighing deviations on the other.

Mr. Hustis has a power of quick analysis, of quick judgment of character, and of quickly arriving at decisions, that brings out the best in his employees without ever suggesting the "driver." It is said, and probably with literal truth, that there is hardly a minor officer on the Boston & Albany who does not "cherish a speaking acquaintance with Hustis." In other words, he has that rare quality in an executive of commanding the respect of his subordinate, while never for an instant standing aloof from him. Not long after Mr. Hustis had taken the Boston & Albany, in speaking of his own work he said: "It is the men at the switches, on the trains, in the yards that do the real work. All that I can do is to try to find out where the weak points are and try to strengthen them."

James H. Hustis was born in New York City in 1864, and began railroad work as office boy in the general manager's office of the New York Central & Hudson River. In 1891 he was



James H. Hustis.

appointed trainmaster on the Harlem division, and two years later was made assistant superintendent. In 1900 he was appointed superintendent of the Harlem division, was later made superintendent of the River division (the West Shore), and served as superintendent of the Rome, Watertown & Ogdensburg, of the Hudson division and of the Putnam division. In 1907 he was made general superintendent of the western district, and in October of the same year was given charge of the Boston & Albany with the title of assistant general manager. In June, 1911, he was given the title of vice-president, and the operation of the Boston & Albany was put entirely in his charge.

STATISTICS OF RAILWAYS FOR THE YEAR ENDED JUNE 30, 1912.

This abstract is based upon compilations covering the fiscal year ended June 30, 1912, made from the annual reports of carriers having gross operating revenues of \$100,000 or more for the year and also of railway companies owning property operated by the same carriers under lease or other agreement, which have been made in advance of the completion of the twenty-fifth annual statistical report of the Interstate Commerce Commission. The omission of returns for small roads prevents the showing of items comparable with complete figures for 1911. None of the statements include returns for switching and terminal companies. The figures given in the abstract may be somewhat modified by revision before they are presented in the full report for 1912.

MILEAGE.

On June 30, 1912, the roads covered by this abstract represented 240,239 miles of line operated, including 10,825 miles used under trackage rights. The aggregate mileage of railway tracks of all kinds covered by operating returns for these roads was 360,714 miles. There were single track, 240,239 miles; second track, 24,930; third track, 2,512; fourth, fifth and sixth tracks, 1,784; yard track and sidings, 91,250. These figures indicate, for the roads under consideration, an increase of 8,926 miles over corresponding returns for 1911 in the aggregate length of all tracks, of which increase 3,167 miles, or 35.49 per cent., represent yard track and sidings.

EQUIPMENT.

There were 61,250 locomotives in service on June 30, 1912, an increase of 979 over the previous year. Of the total number of locomotives, 14,206 were classified as passenger, 36,600 as freight, 9,475 as switching, and 969 were unclassified.

The total number of cars of all classes in the service of such roads was 2,368,658 (or 25,245 more than on June 30, 1911), which equipment was assigned as follows: Passenger service, 50,606 cars; freight service, 2,203,128; company's service, 114,924. The figures given do not include so-called private cars of commercial firms or corporations. Of cars in freight service, there were classified 2,202,966, as follows:

Type.	Number.	Aggregate capacity in tons.
Box	1,002,461	33,975,288
Flat	146,050	4,990,796
Stock	76,392	2,333,976
Coal	852,720	36,588,734
Tank	7,795	310,348
Refrigerator	30,681	950,530
Other cars in freight service	86,867	3,498,287
Total	2,202,966	82,647,959

The average number of locomotives per 1,000 miles of line was 255, and the average number of cars per 1,000 miles of line, 9,860. The number of passenger-miles per passenger locomotive was 2,263,019, and the number of ton-miles per freight locomotive was 7,077,428.

The number of locomotives and cars in the service of the carriers under consideration aggregated 2,429,908, of which 2,410,440, or 99.20 per cent. as against 99.01 per cent. in 1911, were

fitted with train brakes, and 2,425,265, or 99.81 per cent. as against 99.77 per cent. in 1911, were fitted with automatic couplers. Of the 2,203,128 cars in freight service on June 30, 1912, the number fitted with train brakes was 2,194,694 and the number fitted with automatic couplers was 2,199,301.

EMPLOYEES.

The total number of persons reported as on the pay rolls was 1,699,218, or an average of 707 per 100 miles of line. As compared with corresponding returns for June 30, 1911, there was an increase of 45,987. There were 63,558 enginemen, 66,408 firemen, 49,051 conductors, 135,959 other trainmen, and 39,530 switch tenders, crossing tenders, and watchmen. The total amount of wages and salaries reported as paid to railway employees during the year ended June 30, 1912, for the roads under consideration was \$1,243,113,172.

CAPITALIZATION OF RAILWAY PROPERTY.

On June 30, 1912, according to the annual reports under consideration, the par value of the capital outstanding was \$19,533,750,802. This amount includes capital held by the railway companies concerned, as well as by the public. Of the total amount of such capital outstanding there existed as stock \$8,469,560,687, of which \$6,882,813,008 was common and \$1,586,747,679 was preferred; the remaining part, \$11,064,190,115, representing funded debt, consisted of mortgage bonds, \$8,019,700,886; collateral trust bonds, \$1,279,128,266; plain bonds, debentures, and notes, \$1,067,567,350; income bonds, \$263,441,054; miscellaneous funded obligations, \$116,170,300; and equipment trust obligations, \$318,182,259.

Of the total capital stock outstanding, \$2,909,693,873, or 34.35 per cent., paid no dividends. The amount of dividends declared during the year (by both operating and non-operating companies represented in this statement) was \$400,432,752, or 7.20 per cent., on dividend-paying stock. The average rate of dividends paid on all stocks outstanding pertaining to the roads under consideration was 4.73 per cent. No interest was paid on \$808,464,701, or 7.52 per cent., of the total amount of funded debt outstanding other than equipment trust obligations.

INVESTMENT IN ROAD AND EQUIPMENT.

The expenditures for additions and betterments, as well as the expenditures for new lines and extensions, during the fiscal year 1912 were as follows:

Investment to June 30, 1912.....	\$15,895,657,969
Investment to June 30, 1911.....	15,518,264,612
Increase 1912 over 1911.....	\$377,393,357
Expenditures for additions and betterments.....	
Expenditures for new lines and extensions.....	
From cash or other working assets.....	\$187,976,646
From special appropriations.....	32,553,291
Through issue of securities.....	113,592,193
Unassigned.....	2,134,855
Total.....	\$336,256,985
Total expenditures during year.....	\$188,109,282
Property retired or converted.....	\$67,371,604
Adjustments.....	17,290,466
Difference between record value of grantor and purchase price of grantee in case of roads sold, merged, consolidated, etc.....	62,310,840
Total.....	146,972,910
Net increase during year.....	\$377,393,357

PUBLIC SERVICE OF RAILWAYS.

The number of passengers carried during the year was 994,158,591. The corresponding number for the year ended June 30, 1911, was 987,710,997. The increase in the number of passengers carried during the year over corresponding returns for 1911 was 6,447,594.

The passenger mileage was 33,034,995,806. The corresponding return for 1911 was 73,465,336 more. The passenger mileage per mile of road was 139,356, as against 142,859 for the preceding year.

The number of tons of freight carried (including freight received from connections) was 1,818,232,193, while the corresponding figure for the previous year was 1,753,189,939, the increase being 65,042,254.

The ton mileage was 262,955,605,123. The corresponding ton mileage as reported for the year ended June 30, 1911, was 253,456,389,237. The increase in the ton mileage over 1911 was 9,499,215,886. The number of tons carried one mile per mile of road was 1,108,578, as against 1,088,314 for 1911. The average number of tons of freight per train-mile was 409. The corresponding figure for the preceding year was 386.

The average receipts per passenger per mile, as computed for the year ended June 30, 1912, for the roads covered by this statement, were 1.985 cents; the average receipts per ton per mile, 0.743 cent. The passenger service revenue per train-mile was \$3.04015. The average operating revenues per train-mile were \$2.30201. The average operating expenses per train-mile were \$1.59544. The ratio of operating expenses to operating revenues was 69.30 per cent.

REVENUES AND EXPENSES.

The operating revenues of the railways herein represented (average mileage operated 237,809 miles) were \$2,826,917,967; their operating expenses were \$1,958,963,431. The corresponding returns for 1911 (average mileage operated 234,366 miles) were: Operating revenues, \$2,772,733,828; operating expenses, \$1,901,399,475. The following figures present a statement of the operating revenues for 1912 in detail:

Freight revenue	\$1,956,802,927
Passenger revenue	657,422,999
Excess baggage revenue	7,473,128
Parlor and chair car revenue	658,800
Mail revenue	50,674,758
Express revenue	72,970,758
Milk revenue (on passenger trains)	8,323,683
Other passenger revenue	5,228,969
Switching revenue	29,331,726
Special service-train revenue	2,078,910
Miscellaneous transportation revenue	6,174,062
Total revenue from operations other than transportation	27,367,678
Joint facilities—Dr.	—918,586
Joint facilities—Cr.	3,328,155
Total operating revenues	\$2,826,917,967

Operating expenses, as assigned to the five general classes, were:

Maintenance of way and structures	\$363,495,583
Maintenance of equipment	448,303,785
Traffic expenses	60,568,586
Transportation expenses	1,013,340,697
General expenses	73,254,780

Total operating expenses

With minor eliminations from the figures given above, operating revenues per mile of line operated averaged \$11,881 and operating expenses \$8,234 for the year.

CONDENSED INCOME ACCOUNT AND PROFIT AND LOSS ACCOUNT.

There is given below a condensed income account and profit and loss account of operating roads, the gross operating revenues of which were \$100,000 or more for the year ended June 30, 1912. A similar statement follows for non-operating roads (leased, operated under contract, etc.) controlled by the operating roads described. The statements omit returns for a few roads, the reports of which were not sufficiently complete for inclusion therein. For a number of items, such as dividends, taxes, etc., both statements must be taken into consideration in order to learn the aggregates of such items. Thus the aggregate of dividends declared during the year, \$400,308,609, includes those declared out of current income and those declared from surplus both by the operating roads and by the non-operating roads. This amount includes dividends declared on railway capital stock owned by other railway companies.

OPERATING ROADS. Income Account.

Rail operations:	
Operating revenues	\$2,826,917,967
Operating expenses	1,958,963,431
Net operating revenue	\$867,954,536

Outside operations:	
Revenues	\$63,527,073
Expenses	62,489,614
Net revenue from outside operations	1,037,459
Total net revenue	\$868,991,995
Taxes accrued	113,122,509
Operating income	\$755,869,486
Other income	255,611,495
Gross income	\$1,011,480,981
Rents, interest, and similar deductions from gross income	609,661,490
Net corporate income	\$401,819,491
Disposition of net corporate income:	
Dividends declared from current income	\$246,372,011
Appropriations for additions and betterments	37,186,102
Appropriations for new lines and extensions	77,082
Appropriations for other reserves	5,463,269
Total	289,098,464
Balance to credit of profit and loss	\$112,721,027
Profit and Loss Account.	
Credit balance on June 30, 1911	\$1,065,793,723
Credit balance for year 1912 from income account	112,721,027
Total	\$1,178,514,750
Dividends declared out of surplus	100,433,571
Difference	\$1,078,081,179
Appropriations for additions and betterments	\$4,274,626
Appropriations for new lines and extensions	106,542
Appropriations for other reserves	3,020,920
Other profit and loss items—debit balance	16,449,742
Total	23,851,830
Balance credit June 30, 1912, carried to balance sheet	\$1,054,229,349

NON-OPERATING ROADS.

Income Account.	
Gross income from lease of road	\$124,533,101
Salaries and maintenance of organization	352,898
Taxes accrued	6,777,870
Net income from lease of road	\$117,402,333
Other income	6,495,874
Gross income	\$123,898,207
Interest, and similar deductions from gross income	69,754,356
Net corporate income	\$54,143,851
Disposition of net corporate income:	
Dividends declared from current income	\$37,556,473
Appropriations for additions and betterments	1,067,278
Appropriations for new lines and extensions	16,943
Appropriations for other reserves	16,783
Total	38,657,477
Balance to credit of profit and loss	\$15,486,374
Profit and Loss Account.	
Credit balance on June 30, 1911	\$66,257,339
Credit balance for year 1912 from income account	15,486,374
Total	\$81,743,713
Dividends declared out of surplus	15,946,554
Difference	\$65,797,159
Appropriations for additions and betterments	\$1,173,439
Appropriations for new lines and extensions	115,000
Appropriations for other reserves	11,117,804
Other profit and loss items—debit balance	
Total	12,406,243
Balance credit June 30, 1912, carried to balance sheet	\$53,390,916

UNIFICATION OF CHINESE RAILWAY ACCOUNTS.—Dr. C. C. Wang has gone to Europe in company with Mr. Tsang Kuang-hsiang, inspector general of railways, to study the various systems of accounting in vogue in various countries. They will be gone several months, and their investigations should lead to great benefits to China in future. Dr. Wang's mission is not likely to be as resultless as many other missions which China has from time to time sent abroad.

KIRIN-CHANGCHUN RAILWAY, CHINA.—The biggest towns on this line are Kirin and Changchun, which, although they are trading marts, do not possess the qualities of such extensive development as is possible with a port accessible both by land and water routes. If the railway is prolonged to the bank of the Sungari river it will be connected with the water route and there will be great developments possible because of the increased facilities. After completion the receipts of the line will be materially increased. The Minister of Communications has approved this proposal.

TRAIN ACCIDENTS IN JUNE.¹

Following is a list of the most notable train accidents that occurred on railways of the United States in the month of June, 1913:

Collisions.					
Date.	Road.	Place.	Kind of Accident.	Kind of Train.	Kil'd. Inj'd.
1.	Boston Term.	Boston.	xc.	P. & P.	1 0
2.	N. Y., N. H. & H.	North Kent.	bc.	F. & F.	1 1
3.	Boston & M.	S. Lawrence.	xc.	P. & P.	0 20
†12.	N. Y., N. H. & H.	Stamford.	rc.	P. & P.	6 22
18.	Lake Shore & M. S.	Kalamazoo.	bc.	P. & F.	2 37
22.	Chi., Mil. & St. P.	Delmar J.	rc.	F. & F.	3 1
27.	N. Y., N. H. & H.	Canaan.	xc.	P. & F.	0 8
	C. N. E.				
Derailments.					
Date.	Road.	Place.	Cause of Derailm't.	Kind of Train.	Kil'd. Inj'd.
1.	Great Northern	Barnesville.	neg.	P.	1 19
1.	C., C. & St. L.	Stockwell.	b. journal.	F.	2 5
†18.	M., Kan. & Tex.	Hailey.	acc. obst.	P.	1 53
18.	Boston & M.	Graniteville.	unx.	P.	0 1
20.	Mobile & O.	Wickliffe.	d. track.	P.	0 1
22.	Pennsylvania	Cuylerville.	d. track.	P.	0 38
23.	Del. & Hudson.	Minooka.	exc. speed.	F.	2 1
24.	Annapolis S. L.	Severnside.	runaway.	F.	0 0
28.	Ches. & Ohio.	Fulton, Ind.	d. track.	P.	0 21

In the collision at the South station at Boston on the 1st, a local passenger train entering the station ran into the side of another passenger train which was coming out, and overturned one parlor car. The 15 passengers in this car all escaped with slight injuries, but a brakeman was fatally scalded. The collision was due to disregard of a signal.

The trains in collision at North Kent, Conn., on the night of the 2d were a southbound train consisting of a locomotive and two empty passenger cars and a northbound milk train. The fireman of the southbound train was killed and the engineer was injured. The cause of the collision was disregard of despatcher's orders on the part of the southbound train.

In the collision of passenger trains at South Lawrence, Mass., on the 18th 18 passengers and two employees were injured, none very seriously. A passenger train consisting of two cars backing into the station from a branch was run into by one from Boston, the latter being at fault. The Massachusetts Railroad Commission, reporting on the collision, ordered the abandonment of ball signals (not interlocked).

The trains in collision at Stamford, Conn., on the 12th were westbound express No. 53, first and second sections. The first section had been stopped for a change of engines and was run into by the second section, which had passed distant and home signals set against it. This collision was reported in the *Railway Age Gazette* of June 20 and 27; and the Interstate Commerce Commission's report is noticed in the issue of July 18. Six passengers were killed.

The butting collision at Kalamazoo, Mich., on the 18th was between a northbound passenger train and a southbound work train, and both engines were badly wrecked. Two employees were killed and 31 passengers and 4 trainmen were injured. The collision was due to disregard of rules on the part of the work train, which encroached on the right of the passenger train.

The trains in collision near Delmar Junction, Iowa, on the 22d were eastbound freight train No. 70 and a work train engaged in distributing material. One engine and twenty cars were damaged. Three trespassers in a box car were killed and one was injured. The collision was due to the wrongful assumption, on the part of No. 70, that the block section was clear, after having received notice that the section was occupied by the work train.

The trains in collision at Canaan, Conn., on the 23rd of June, were a southbound milk train of the N. Y. N. H. & H. and an eastbound freight of the Central New England, the collision oc-

curing at the crossing of the two roads. Eight passengers in the coach of the milk train were injured. The passenger car of the milk train was backed into the freight train, on the crossing, when the front part of the train was coupled to the rear part.

The train derailed near Barnesville, Minn., on the evening of the 1st was the westbound Oriental limited express and the engine and first three cars were overturned. The engineer was killed and six employees and 13 passengers were injured. The cause of the derailment was disregard of a signal at an interlocking.

The train derailed near Stockwell, Ind., on the 1st was a westbound freight, and 12 loaded cars were wrecked. Two trespassers riding on the cars were killed and five others were injured. The cause of the derailment was a broken journal.

The train derailed on the Missouri, Kansas & Texas, at Hailey, Okla., on the 8th, was southbound passenger No. 9, and four of the cars were wrecked. One passenger was killed and fifty passengers and three trainmen were injured. The wreck occurred at 3 a. m. and was caused by striking four horses which were on the track. One of the horses was thrown against a switch stand with such force as to break the connection to the rails and throw a car off the track.

The train derailed near Graniteville, Mass., on the 18th was an express train bound from New York City to Bar Harbor, and seven of the nine cars in the train ran off the track. Of the 75 passengers in the train all escaped without serious injury. One employee was injured. The cause of the derailment is reported as not fully determined; the tender was the first vehicle to leave the track.

The train derailed near Wickliffe, Ky., on the 20th was a northbound passenger. One sleeping car was overturned and its conductor was injured. The cause of the derailment was distortion of track by solar heat.

The train derailed at Minooka, Pa., on the 23d consisted of a locomotive only, and it is said that the cause of derailment was excessive speed on a curve. The engineer was killed, and also a fireman riding on the engine, deadhead; and the fireman of the engine was injured.

The train derailed near Cuylerville, N. Y., on the 22d was a southbound excursion of six cars, occupied by about three hundred passengers. Four cars were ditched when the train was running over an easy curve at a moderate speed. The number of persons injured was thirty-eight, though the names of only eight are given as seriously injured. The cause of the derailment was a broken tender truck.

The train derailed on the Annapolis Short Line at Severnside, Md., on the 23d was a freight consisting of a locomotive, 5 cars and a caboose. The train became uncontrollable on a descending grade and plunged through a partly open draw and fell into the river. There were no serious injuries, though the engineer and fireman narrowly escaped.

The train derailed near Fulton, Ind., on the 28th was eastbound express No. 6, and a sleeping car and a dining car were overturned. One employee in the dining car and about twenty passengers were injured. The train was running about 20 miles an hour. The cause of the derailment was the distortion of the track by solar heat.

Canada.—Eight passengers were killed in a derailment on the Canadian Pacific, near Ottawa, on Wednesday, June 25, as reported in the *Railway Age Gazette* of July 4, page 26.

¹Abbreviations and marks used in Accident List:
rc, Rear collision—bc, Butting collision—xc, Other collisions—b, Broken—d, Defective—unf, Unforeseen obstruction—unx, Unexplained—derail, Open derailing switch—ms, Misplaced switch—acc. obst., Accidental obstruction—malice, Malicious obstruction of track, etc.—boiler, Explosion of locomotive on road—fire, Cars burned while running—P. or Pass., Passenger train—F. or Ft., Freight train (including empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly destroyed by fire—Dagger, One or more passengers killed.

NEW TUNNEL FOR INDIA.—The scheme for a new railway tunnel on the Western Ghats Railway has now matured, and the contract for its construction has been let. It will be in the vicinity of Kasara station, between Kalyan and Igatpuri and is 75 miles from Bombay. It will be 140 ft. long, and will run nearly parallel to the old tunnel, but will be on a steeper grade and of a slightly larger area. It is expected that the work of construction will occupy about 18 months.

LONG ISLAND IMPROVEMENTS AT JAMAICA.

The Elevation of Tracks, Including the Separation of Railway Grades at Three Points, and a New Station and Office Building.

The Long Island Railroad is now completing very extensive improvements at Jamaica, L. I., involving an expenditure of about \$3,000,000. This work involves a number of unusual and very interesting problems, including, as it does, the elevation of all tracks for a distance of about two miles, the separation of grades of intersecting branches at three different points and the construction of a station and general office building. While the city of Jamaica has only 25,000 population, it is the center of the Long Island system, from which lines radiate in six different directions to the various parts of the island. It is essentially a transfer station and the number of passengers changing from one train to another at this point is very large.

The main line extends northwest to Long Island City and through the tunnels under the East river to the new Pennsylvania terminal in uptown New York, a distance of about 11 miles. The Atlantic division extends west to Flatbush station, Brooklyn, about the same distance, where connection is made with the subway for downtown New York. The Montauk division extends northwest between these two lines to Long Island City. East of Jamaica the main line extends along the center

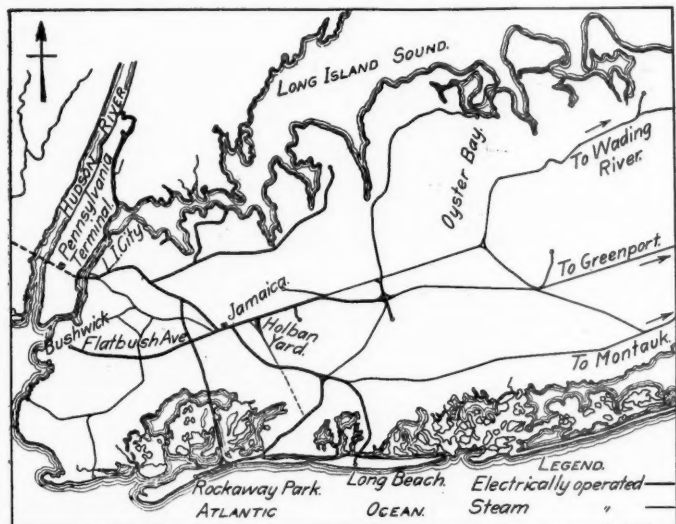
with the general plan for the substitution of electricity for steam on all Pennsylvania lines in the vicinity of New York, the Long Island being a subsidiary of the Pennsylvania, although operated independently. At the present time all trains between Jamaica and the Pennsylvania terminal are operated by electricity as are also all passenger trains going to Flatbush avenue. At the time the subway was built to Brooklyn it was anticipated that Long Island trains would run directly into downtown New York through the subway, and the Flatbush avenue terminal was designed accordingly, but this plan has since been abandoned. The Montauk division to Long Island City and Bushwick, which handles considerable freight traffic and a few passenger trains, is still operated by steam, while several freight trains are moved daily over the Atlantic division towards Flatbush avenue by steam. Preliminary to the undertaking of the Jamaica improvements, the main freight yard was moved out to Holban, about two miles east of Jamaica, eight years ago, and freight trains are made up at this yard for movement by steam either to the transfer bridges at Long Island City or Bay Ridge, or to the eastern portions of the island.

All of the service to Brooklyn and the great bulk of the traffic to the Pennsylvania station is handled by multiple unit trains, but a few of the trains entering Jamaica from New York change from electric to steam power at the Pennsylvania's Sunnyside yard in Long Island City and proceed without breaking up. The multiple unit equipment operating west of Jamaica and the ordinary steam trains running east from Jamaica require, of course, facilities for making up the trains and also for storing and cleaning the equipment.

TRACK ELEVATION AND GRADE SEPARATION.

The most important part of these improvements is the elevation of the tracks. In connection with this it was essential that the traffic over the various lines be separated to avoid opposing crossings at grade and the delay incident to handling over 1,000 passenger trains daily in addition to freight traffic and switching movements to and from the roundhouse and coach and team track yards. The elimination of these crossings entailed some of the most elaborate work of this nature which has ever been undertaken in this country and the arrangement adopted enables trains from any of the branches to be run into and out of the station without crossing or fouling any other line except at the switches at the ends of the station and separates all freight and passenger traffic. The natural topography at Jamaica did not influence the plans to any great extent as the country is essentially flat in the vicinity of the improvements.

To secure an idea of the magnitude of the problems involved it is necessary to study the track layout adopted and especially the arrangement of the various main lines entering the station. The two existing tracks on the Atlantic division coming east from Flatbush avenue are increased to four, the two outside tracks being devoted to local passenger service. These tracks remain on the present ground level until opposite the roundhouse, when they begin to ascend onto the elevation on a 0.7 per cent. grade, this being the standard adopted for all permanent main line approaches to the elevation. From Maure avenue the eastbound Atlantic division freight track and both passenger tracks continue on a slightly ascending grade to Van Wyck avenue, where the eastbound freight track swings to the south around the new passenger station, which is located between Foley and Guilford streets. The westbound Atlantic division freight track descends on a 1.7 per cent. grade from a connection with the Montauk division main tracks near Van Wyck avenue, to west of Maure avenue, where it joins the Atlantic division passenger tracks. The two Montauk division main tracks ascend eastwardly on a 0.7 per cent. grade im-



Long Island Tracks in Vicinity of Jamaica.

of the island to Greenport and to Shelter Island, with branches to Oyster Bay and Wading River along Long Island sound. The Montauk division turns south from the main line about two miles east of Jamaica and follows the south shore of the island to Montauk Point at the eastern end. The Old Southern branch turns south immediately at the station and extends to the beaches on the south shore.

The Long Island is essentially a passenger road, depending very largely upon suburban travel. Over 63 per cent. of the gross earnings are derived from passenger revenue as compared with 32 per cent. from freight. This passenger travel is largely commuter traffic, increased very greatly during the summer months. About 65,000 passengers, or two-thirds of all those carried by the Long Island for New York, are now delivered at Flatbush avenue daily, although the number going directly to the uptown terminal has grown rapidly since the completion of the new Pennsylvania station and will increase at a greater rate upon the completion of the Seventh avenue subway. The traffic is so divided that it is impossible to arrange any schedules in which a large proportion of the passengers will not have to transfer at Jamaica, and the problem at this station is therefore to facilitate this transfer as much as possible.

The improvements at Jamaica are being made in accordance

mediately after crossing Ridgewood avenue, this northerly or westerly limit of the elevation, however, being but temporary, as upon the completion of the Jamaica improvements it is intended to elevate the tracks across Ridgewood avenue for a mile farther west through Richmond Hill. Just north of the roundhouse, the westbound Montauk division track divides into two tracks for passenger and freight service respectively. These three tracks then ascend on a 0.7 per cent. grade, crossing over two tracks at Maure avenue, which leads from the Atlantic division westbound freight track to the passenger coach cleaning yard, used for movements between the roundhouse and the coach yard. The westbound passenger track then descends on a 1.7 per cent. grade to the level of the Atlantic division passenger tracks, passes under the eastbound main line tracks and enters the station. The two other Montauk division tracks continue on the high level to Van Wyck avenue, where they cross over the Atlantic division passenger tracks. Eastbound Montauk division passenger trains enter the station over the eastbound

cent. with the traffic. The main line and Montauk division tracks proceed east from the station on a 0.7 per cent. ascending grade, crossing over Rockaway Road, after which they descend to the level of the present tracks between Prospect and Washington streets.

SPECIAL STRUCTURES.

Complicated work was encountered at Van Wyck avenue, where two tracks of the main line and two of the Montauk division cross over six tracks of the Montauk and Atlantic divisions directly over the street, necessitating a three level structure costing about \$250,000. In connection with this work, Van Wyck avenue was widened from 66 ft. to 100 ft., of which 18 ft. 6 in. on each side was given over to sidewalks. The entire structure is of steel with center and curb supports, the center posts being enclosed by concrete walls for protection against damage by traffic. The vertical posts were designed to extend continuously from the footing to the upper deck and are of built-up I-beam



Track Layout and Profile of Complete Development at Jamaica.

main line passenger tracks through a series of cross-overs. The main line, which is used almost entirely for passenger traffic, comes in from the north with four tracks connecting with the other lines at Van Wyck avenue on a 3 deg. curve. North of Ridgewood avenue the elevation of these tracks connects with work previously completed. Entering the station, the eastbound tracks rise to the high level, crossing over the entrance to the receiving yard, and the westbound passenger connection to the Montauk division and over the four Atlantic division passenger tracks, after which they descend to the station level. The westbound main line tracks lead directly from the throat of the station on a level grade without crossing the tracks of any other division.

East of the station the principal complications arose from a connection with the Old Southern branch. Both tracks of this branch cross under the two main freight tracks and the two eastbound passenger tracks and then ascend to the level of the station between the eastbound and westbound passenger tracks on grades ranging from 2 per cent. against the traffic to 2.9 per

cent. against the traffic. The tracks on the intermediate level are carried on a solid floor of 15 in. I-beams embedded in concrete, these beams being in turn riveted to main girders 54 in. deep. A similar construction was adopted on the upper floor with the exception that the I-beams rested directly upon the upper flanges of another set of cross girders, and here concrete was used to protect the under surface of the steel floor system from the action of the gases from locomotives on the intermediate level. A clearance of 14 ft. is provided on the street level, and of 16 ft. 9 in. on the lower track level, the upper level being a deck structure.

Another special structure is that at Maure avenue, where this street is carried under tracks crossing at two different levels by a 32 ft. segmental arch. This arch is over 500 ft. long, extending under the advance and receiving yards as well as the main lines. It was constructed in short sections, each comprising about 200 yd. of concrete placed as the elevation of the tracks progressed, steel forms being used and moved from one section to another. The crossing of tracks at different levels gave rise to the great-

est complications here, as at Van Wyck avenue. Three Montauk division main tracks cross over two tracks leading to the Morris Park coach cleaning yard a short distance west of the street at such an angle that it was necessary for one of the wing walls of the underpass to extend over the arch. In order to carry this wall across the arch without placing its weight on the crown, thereby introducing eccentric loading, a special concrete beam was designed, the lower surface of which conformed roughly to the contour of the upper arch ring and which carried the load of the wall onto the haunches of the arch. This beam was built on the line of the wall on a skew of 75 deg. with the center of the arch, and is 53 ft. 3 in. long, this dimension in itself being unusual for a beam of this construction. The beam is 16 ft. 8 in. deep over the center of the arch and 25 ft. deep at the ends. It was very heavily reinforced horizontally along the base and the front face as well as vertically. The beam was designed with a chamber of 9 in. The interesting features of this unusual design are shown in the accompanying drawing.

Other streets at which openings under the tracks are maintained are Foley, Guilford, Rockaway road and Church streets. At Guilford street the design was complicated by details of the station, which will be referred to later.

RETAINING WALLS.

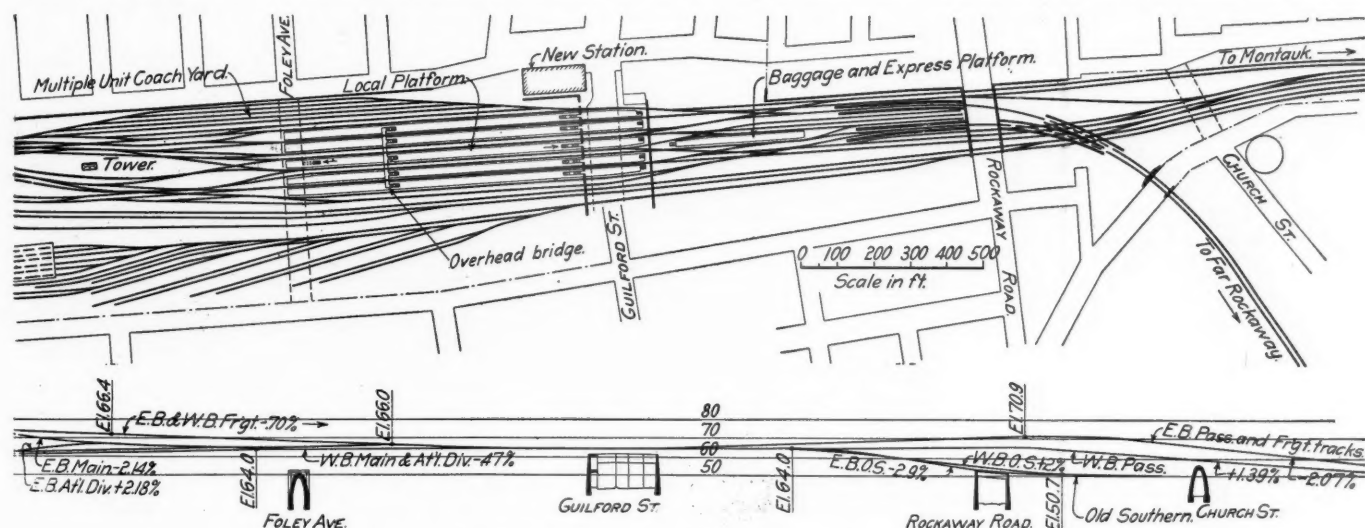
Including all work at the various street crossings, over 100,000 cu. yd. of concrete are required on the entire project. During the past few months between 4,000 and 5,000 yd. of concrete have been deposited monthly. A large amount of this goes into retaining walls along property lines, and between adjacent tracks at different elevations. In the design of these walls nothing un-

usual has been brought out, as they follow general standards except that in a number of instances walls are built between high and low level tracks resting on the fill and anticipating some settlement. It would otherwise have been necessary to carry the footing down through this filling to a solid foundation beneath. It was deemed advisable to anticipate some settlement and make provision for it, and while such settlement has occurred in some instances, there have been no serious effects and the cost of these walls has been greatly reduced. One interesting detail has been developed in their construction. In several instances where a considerable length of wall of a uniform section was required, rails were laid on the footings and the forms were mounted on small trucks. After the completion of one section the forms were then rolled to the next section without dismantling them, saving considerable time and expense.

Careful attention was also given to the arrangement of the concrete mixing plant, and after several trials the following was adopted as the most economical. A standard gage track was laid as near the mixer as practicable, on which cars with stone, sand

and cement are set. A narrow gage track leading to the mixer was laid alongside the standard gage track with a second narrow gage track connecting with it near the mixer and at a point beyond the material cars. Small steel cars are loaded on the narrow gage track alongside the material track, the stone, sand and cement being each placed in the car in turn, marks upon the sides of the cars denoting the proper quantities of each. In this way each car is loaded complete with materials for one batch of concrete. The grades on the narrow gage tracks are arranged to provide a down hill run to the mixer and, by a simple arrangement of cables, the loaded car descending pulls an empty one up on the other track. Arriving at the mixer the car dumps its contents into a hopper which is depressed sufficiently to receive the materials by gravity. After mixing the concrete is dumped by gravity into another hopper still lower, which is then elevated in a tower and dumped into a third hopper somewhat above the level of the work. Concrete is released from this hopper by gravity into carts and trucked down grade to the place of deposit. As this hopper has a storage capacity of several batches, practically continuous depositing can be maintained. With this arrangement a relatively small amount of labor is required. With such a plant it has been found possible to mix 200 yd. of concrete daily with a $\frac{1}{2}$ yd. mixer.

Over 1,500,000 cu. yds. of filling material is required for the entire project, of which about 1,200,000 cu. yds. is now in place. This material is brought in in 12 yds. Western air dump cars from Cold Spring, about 25 miles east of Jamaica, where some heavy grade revision and realignment work is in progress. In each instance the first track has been gradually raised to grade by filling underneath it, and trestles have not been resorted to.



Track Layout and Profile of Complete Development at Jamaica. (Continued.)

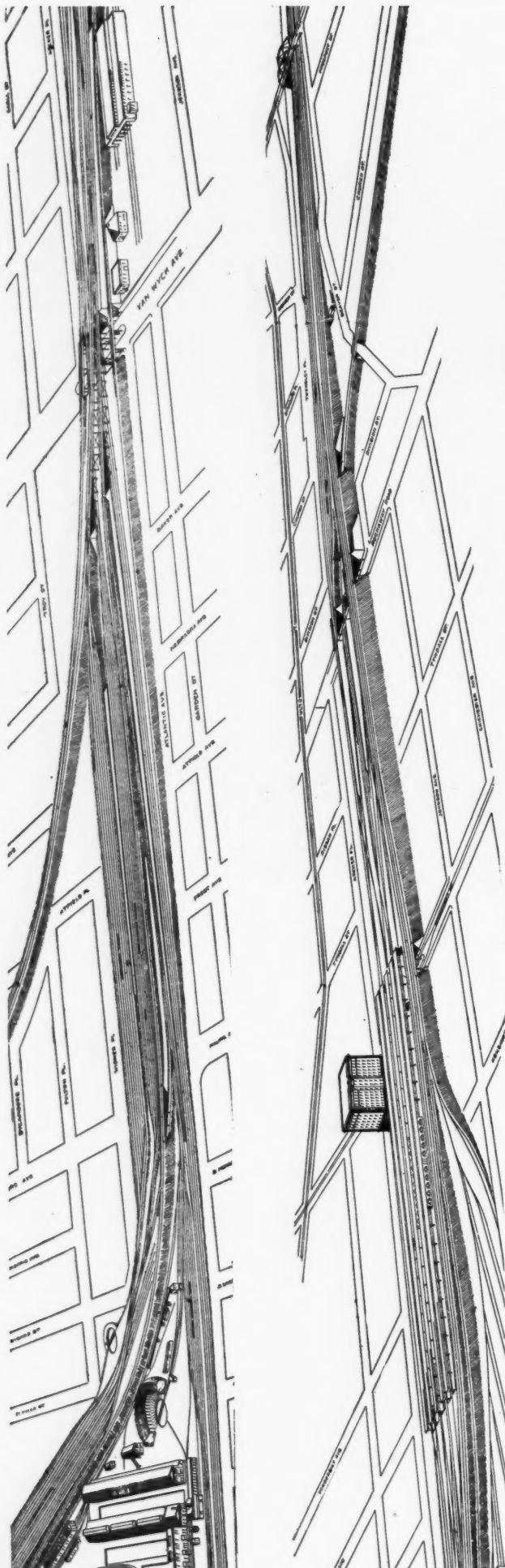
usual has been brought out, as they follow general standards except that in a number of instances walls are built between high and low level tracks resting on the fill and anticipating some settlement. It would otherwise have been necessary to carry the footing down through this filling to a solid foundation beneath. It was deemed advisable to anticipate some settlement and make provision for it, and while such settlement has occurred in some instances, there have been no serious effects and the cost of these walls has been greatly reduced. One interesting detail has been developed in their construction. In several instances where a considerable length of wall of a uniform section was required, rails were laid on the footings and the forms were mounted on small trucks. After the completion of one section the forms were then rolled to the next section without dismantling them, saving considerable time and expense.

Careful attention was also given to the arrangement of the concrete mixing plant, and after several trials the following was adopted as the most economical. A standard gage track was laid as near the mixer as practicable, on which cars with stone, sand

After the first track has been brought to grade the embankment is widened by unloading from it. Where differences in grade exist between adjacent main tracks the slopes are sodded and concrete drains provided to eliminate erosion.

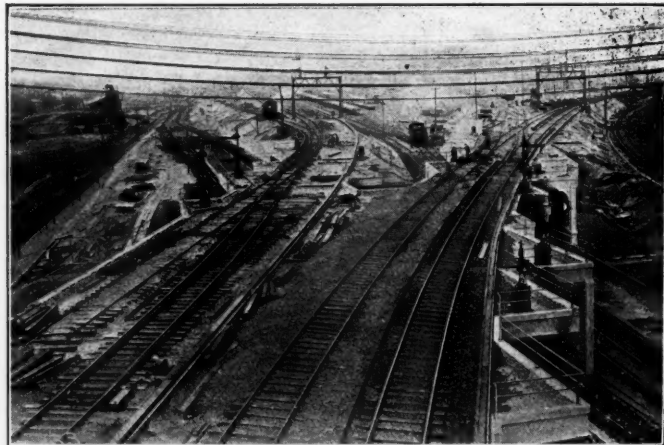
PASSENGER STATION AND OFFICE BUILDING.

In connection with these improvements it was necessary to provide a new station and plans were made for one costing \$235,000, which is now practically complete. The old station was a small frame building located east of Church street on the ground level. As the Old Southern branch left the main line west of this point a separate station was required for this branch and reverse movements were sometimes made into the main station. In planning for the new station a new location west of this junction was essential to serve all branches and a site was selected just west of Guilford street with platforms extending to Foley street. The station building is located on the street level north of the tracks and is five stories high, although the steel work is designed for an ultimate height of 12 stories. The building is



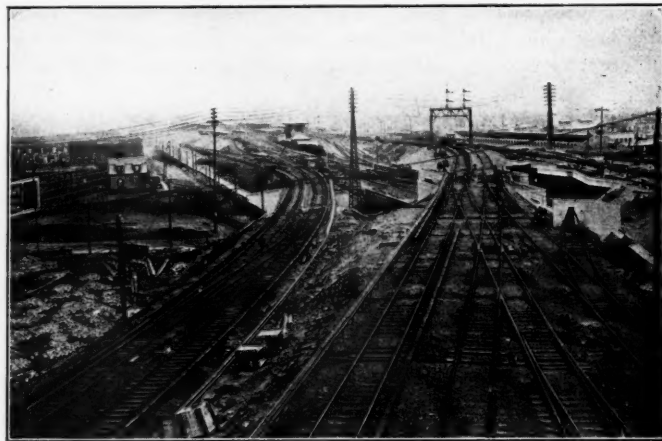
Perspective View of Long Island Improvements at Jamaica.

of steel construction faced with buff terra cotta for the two lower floors and with brick above that. The station facilities utilize the east half of the two lower floors with the usual arrangement



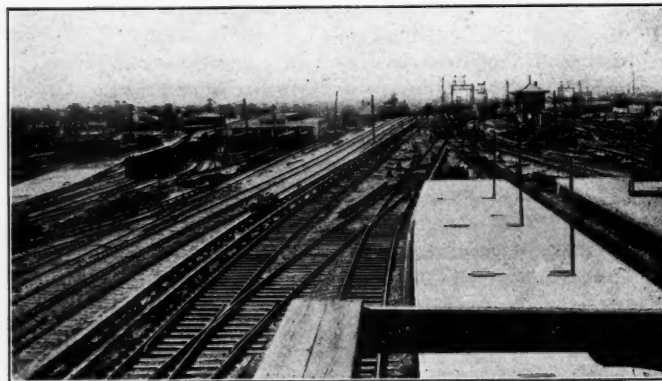
View from High Level Tracks East of Van Wyck Avenue, Looking West.

of ticket offices, check and waiting rooms. The remainder of the building is occupied with the general offices of the road other than the executive offices, which will remain in the Pennsyl-



View from High Level Tracks West of Van Wyck Avenue, Looking Southeast.

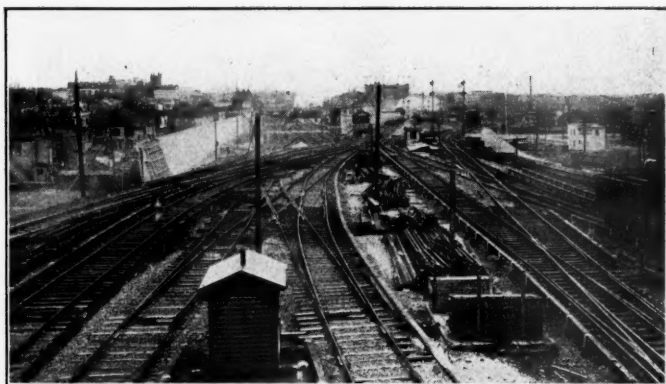
vania Terminal, New York. The waiting room is finished in tile with green trimmings up to a height of 10 ft., above which is a buff mat surface. All openings are trimmed with marble.



View from Top of Shelter Shed at the West End of Platform, Looking West.

Entrance to the platforms is gained by a mezzanine floor connecting with the south end of the waiting room, with stairways to the different platforms, this mezzanine floor being directly

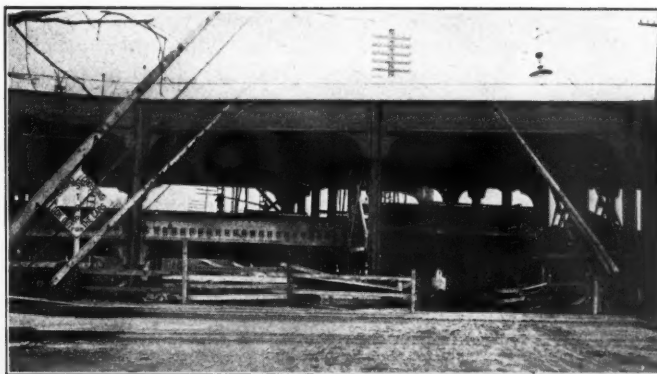
over the street sidewalk along the west side of Guilford street. With the exception of an entrance to the local platform from Foley street at the west end, this mezzanine floor affords the only approach to the platforms. Tandem stairways which separate inbound and outbound traffic lead to the various platforms. Five platforms are provided, each 1,000 ft. long and 22 ft. wide, serving eight tracks in all. These platforms are covered with umbrella sheds of steel construction with timber roofs covered



View Looking East from East End of Station Platforms, Showing High Retaining Wall on Left.

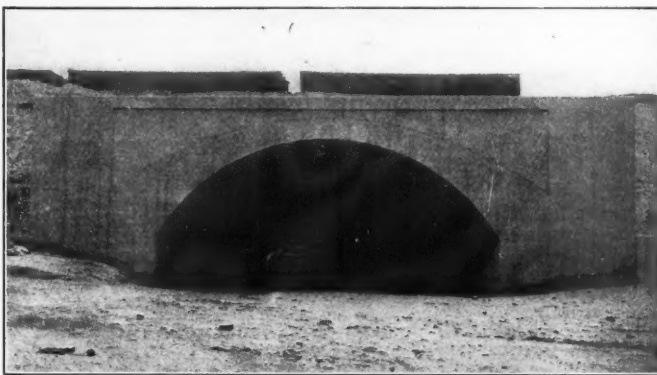
with tar and gravel. The roof is sloped from the center and outer edges towards the posts, with drains leading down the posts to sewers below the platforms. The steel columns are of built-up I-beam sections and with the down spouts are encased in concrete. Two enclosed shelters are provided on each of the platforms and an overhead bridge is built near the west end to enable passengers to transfer from one platform to another.

As the platforms are built on a fill averaging over 20 ft. in

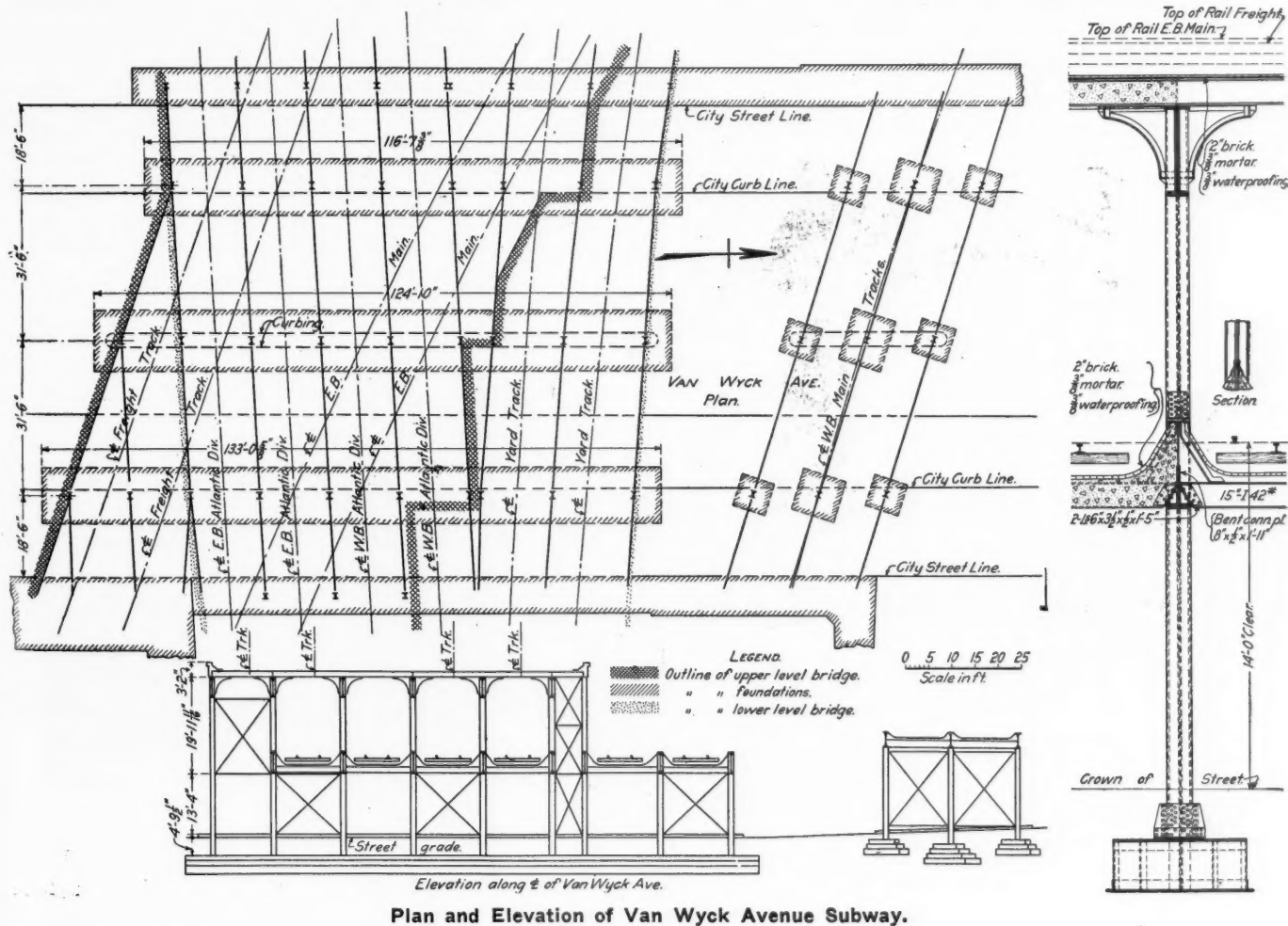


Van Wyck Avenue Bridge, from Roadway, Looking North.

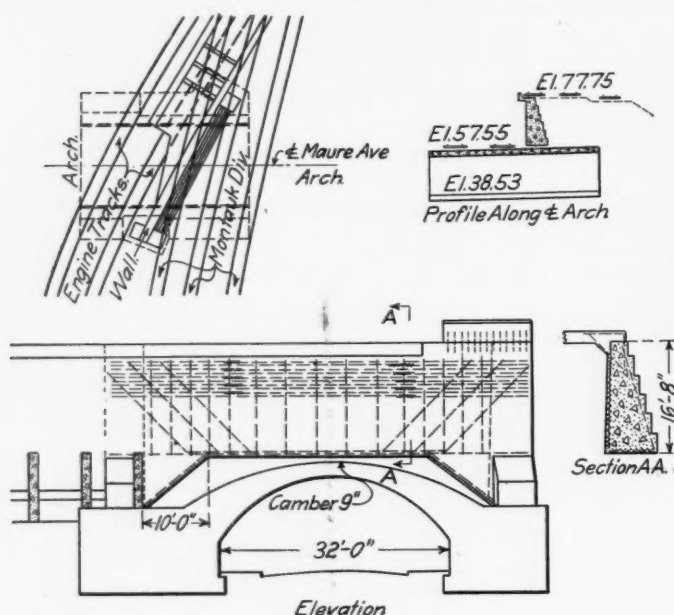
height it is necessary to support them on piles. For this purpose about 600 28-ft. concrete piles, 16 in. in diameter were required.



North Portal of Maure Avenue Arch, Looking South.



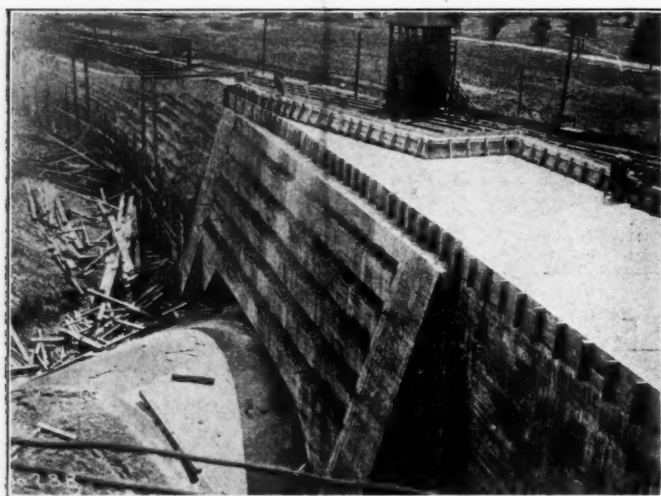
At first these piles were bought in the market, but as it was found that they could be made cheaper on the work most of them were made by company forces. They are reinforced with eight rods running lengthwise through the pile and with spiral banding spaced closely at the top and bottom and spread to a maximum of 12 in. at the center. These piles were cast in a horizontal position and after 24 hours the forms other than the



Plan and Elevation of Special Retaining Wall at Maure Avenue.

bottom boards were removed. After seasoning for two weeks in this position they were stacked up. No piles were driven until after they had been seasoned at least one month. A gang of 20 men was able to make 10 of these piles in a day, and careful figures show that their cost was reduced to about \$.50 per lin. ft.

Two rows of piles were driven under each platform, the rows being spaced 12 ft. center to center, while the piles in each row



Looking Down on the Wing Wall of the Underjump at Maure Avenue.

are spaced 15 ft. between centers. These piles were capped by beams running parallel to and across the platform supporting the concrete floor. The outer edge of the platform is sloped upward slightly for a distance of 2 ft. to prevent passengers from slipping toward the edge. The surface was marked in 2 ft. squares and indented with a spiked roller to provide sure footing and to facilitate the escape of water.

On the east side of Guilford street the express office and a

driveway for express wagons are located under the tracks, the viaduct being lengthened an additional 61 ft. beyond the street line to provide for these facilities. Five elevators are provided to raise baggage and express to the track level. Business re-

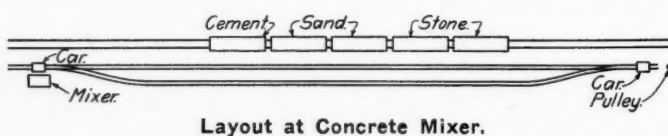


Maure Avenue Underjump Under Construction, Looking West.

quiring transfer from one track to another is lowered to the street level by one elevator and hoisted by another, but provision is made for handling baggage at the track grade in case of emergency.

YARDS.

The extensive rearrangement of tracks required the construction of new yards for storing and cleaning the various types of



equipment, and with the exception of the locomotive terminal, which is left undisturbed at the lower level between the Atlantic and Montauk divisions, two miles west of the station, all the yards at Jamaica were rebuilt. A new 16-track coach cleaning yard for steam passenger equipment with a capacity of 132 cars



Station Building from Track Level, Looking Northeast.

was built on the elevation of the Montauk division opposite the roundhouse. These facilities are complete in themselves with a hollow tile and stucco frame service building, brick boiler house and conduits for air, water and steam pipes.

North of the Atlantic division tracks between Maure and Van Wyck avenues are two coach yards, the northerly or westbound one having eight tracks with a total capacity of 86 cars, and the eastbound one, seven tracks with a capacity of 97 cars. The grades of each are so arranged as to be favorable to movements in the advance direction. A third coach yard for the use of multiple unit equipment is provided north of the west end of the station platform. This yard is on the level of the adjacent main lines and consists of five tracks with a capacity of 56 cars. Directly across the main lines from this are a seven track team track yard, freight house and an inspection and repair shop



Station Building, Platforms and Shelters, Looking West.

for the multiple unit equipment. All of these latter facilities are on the ground level and are reached by a track ascending to a connection with the main freight tracks near Rockaway road.

No. 10 simple or slip switches are generally used in the main tracks, slip switches being used freely in the vicinity of the station because of the limited space available and the wide variety of movements to be provided for. Switches in the vicinity of the station will be controlled by electro-pneumatic interlocking plants. One large tower midway between Foley and Van Wyck avenues will control all switches between the west end of the station and a short distance west of Van Wyck avenue, while a second tower will be placed a short distance east of Guilford street to govern movements at the east end of the station and the connections with the Old Southern branch.

One of the most difficult conditions to contend with in the

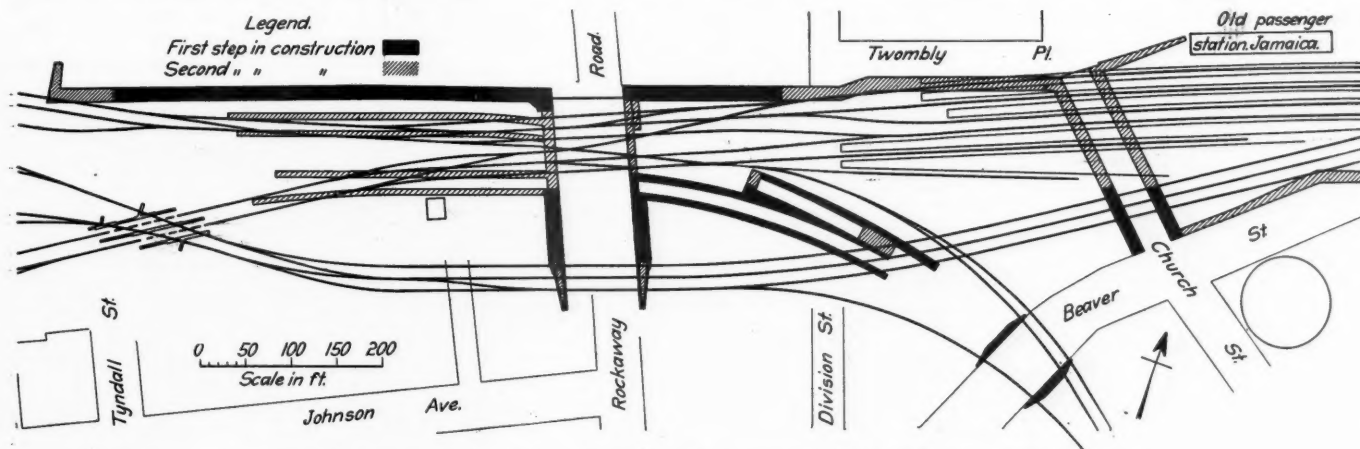
ations in the vicinity of Rockaway road east of the station during the past winter. By removing those tracks in the center of the right of way to the south side and shifting the Old Southern branch connection a short distance west of its permanent location, it was possible to complete those portions of the structures shown solid without interference to the other tracks. Upon the completion of this work the main line tracks were shifted on it and the balance of the concrete work shown hatched was then put in. The tracks could not be shifted to the south until after the summer rush was over, so that it was impossible to start concreting until about October 10. It was then necessary to complete those portions of the work shown solid by February 1 in order that the portion shown hatched could be completed in time to enable the tracks to be placed on their permanent location before the summer traffic began in the early part of June.

This work has been under construction for the past two years and is now practically completed. It has all been handled under the direction of J. L. Savage, chief engineer of the Long Island Railroad; L. B. Morris, chief engineer of Jamaica improvements, and F. Auryansen, bridge engineer. All construction work has been done by company forces under the personal direction of Mr. Savage.

NEW ENGINE TERMINALS ON THE WESTERN MARYLAND.

BY GUSTAVE E. LEMMERICH.

The Western Maryland has about completed new engine terminals at Hagerstown, Md., and Maryland Junction, W. Va. These terminals are practically of the same layout and design, but more room was available at Maryland Junction than at Hagerstown. One of the illustrations shows the arrangement of tracks and buildings at Maryland Junction. This terminal is between two division yards and is laid out so that locomotives from each of the yards can enter at the same time. There are two incoming and two outgoing tracks with engine storage tracks. The incoming tracks have inspection and ash pits and coal can be taken on four tracks; the coaling station is of the Holman type, built by Roberts & Schaeffer. Locomotives which do not re-



Temporary Track Layout for First Stage of Construction Work East of New Station.

prosecution of this work has been the maintenance of traffic at all times. Because of the greatly increased passenger traffic during the summer months this has necessitated the almost entire abandonment of work involving interference with the main lines at this season, requiring the prosecution of such work largely during the winter. This has required the working out of a very careful schedule of operations in advance so that all work tending to interfere with main line operation can be completed before June 1. A good example of this is shown in one of the accompanying drawings illustrating the schedule of oper-

quire to be turned or to go to the engine house, can pass over the crossover to the engine storage tracks.

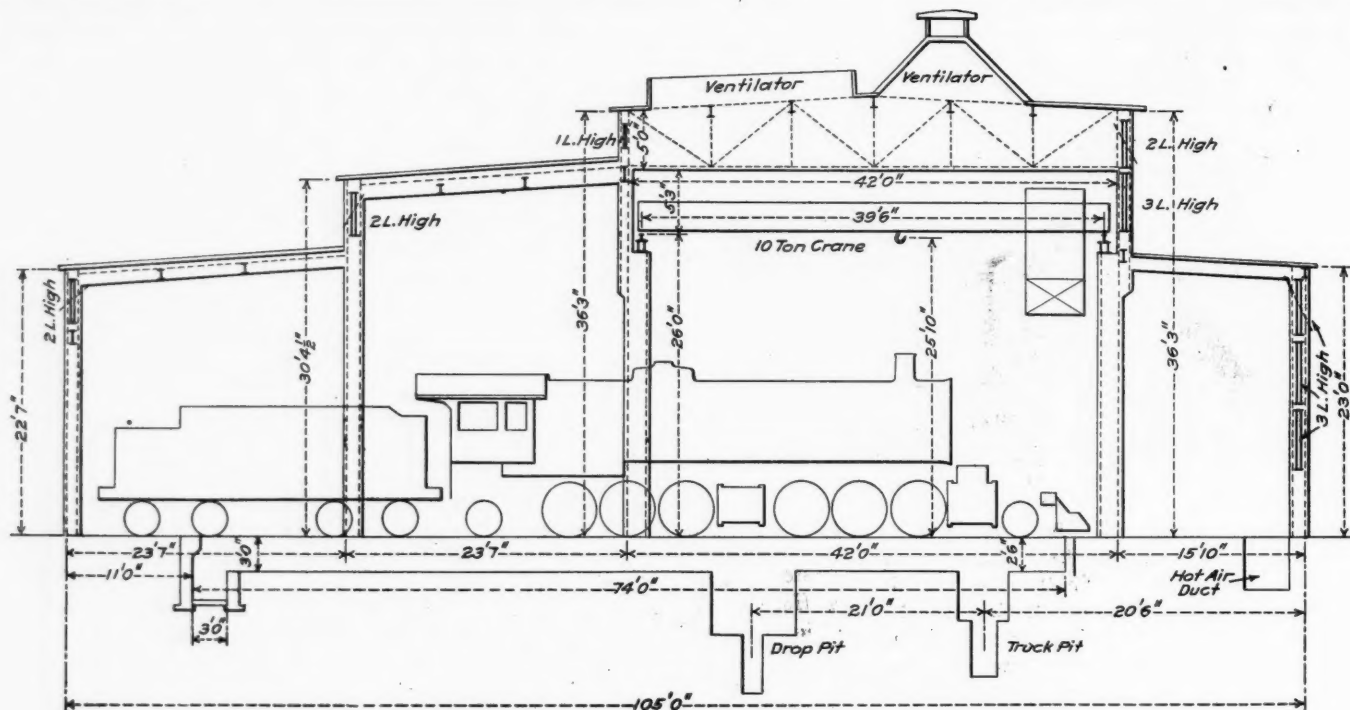
A 100 ft. turntable is provided, which permits the placing of a switch engine and a car on the table at the same time. If the table is installed before the engine house is started a considerable saving is effected in the delivery of material for the construction of the house, and also in time, so that a 100 ft. table is about equal in cost to an 80 ft. one.

The engine house is of 105 ft. wide and is constructed with a steel frame; the outer walls are of brick, with almost all the

space above the window sills occupied by windows. It is heated by hot air through underground ducts, with outlets in the pits and rear walls. The heating system is of liberal proportions, the apparatus being furnished by the Buffalo Forge Company, and a boiler washing system is also installed. The engine house is provided with a 10-ton electric traveling crane.

also extend outside the building. Through these lines of cranes material can be transferred to and from all parts of the shops, storehouse, roundhouse, outside tracks, etc.

The layout and designs were made by the writer under the supervision of H. R. Platt, chief engineer of the Western Maryland. G. E. Painter, Baltimore, was consulting me-



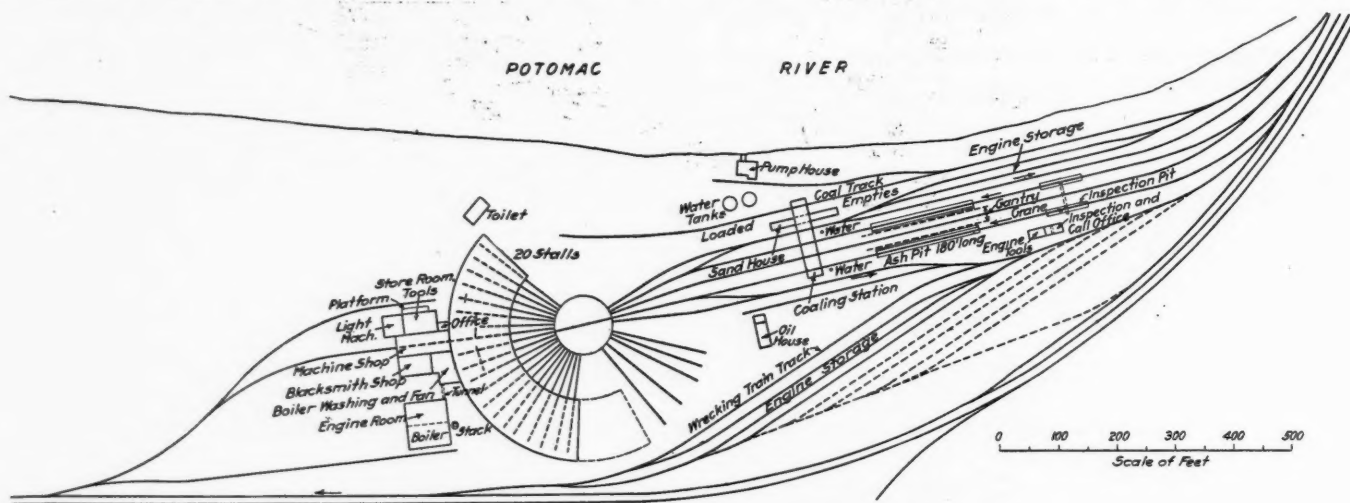
Cross Section Through Western Maryland Engine House, Showing Traveling Crane.

The Western Maryland has had shop facilities of very limited proportions, and on this account these engine terminals had to be equipped on a more liberal scale to tide the motive power department over until proper general repair shops can be developed. All the shop buildings are of a steel frame construction with brick curtain walls and plenty of glass area.

At Maryland Junction the ground next to the engine terminal is intended to be used for a general freight car repair shop

chanical engineer under the supervision of C. R. Tritsch, superintendent motive power and car department of the Western Maryland.

LOCOMOTIVES NEEDED IN NEW SOUTH WALES.—Owing to the shortage of tractive power and the inability of the state to undertake the work of building without serious delay in providing additional workshop plant and facilities, the chief railway



Locomotive Terminal of the Western Maryland at Maryland Junction, Va.

and the machine shop is therefore laid out to be extended to serve this repair shop also. Provision is made for a future traveling crane in the machine shop running from the roundhouse to the outside of the extension; another crane will run at right angles on a midway, connecting the future storehouse, mill, etc., with the freight car shop. Cranes in this shop will

commissioner of New South Wales has made an urgent requisition upon the government for the importation of 80 locomotives. The order, which represents about \$400,000, caused some consternation among the ministers who are in favor of supporting local industries. The matter was deferred pending further information.

DEVELOPMENT OF THE EAST INDIAN RAILWAY.

The Pennsylvania of Asia Has a Mileage of 2,500—Main Trunk Line 1,020 Miles Long Built Nearly 50 Years Ago.

By LEWIS R. FREEMAN.

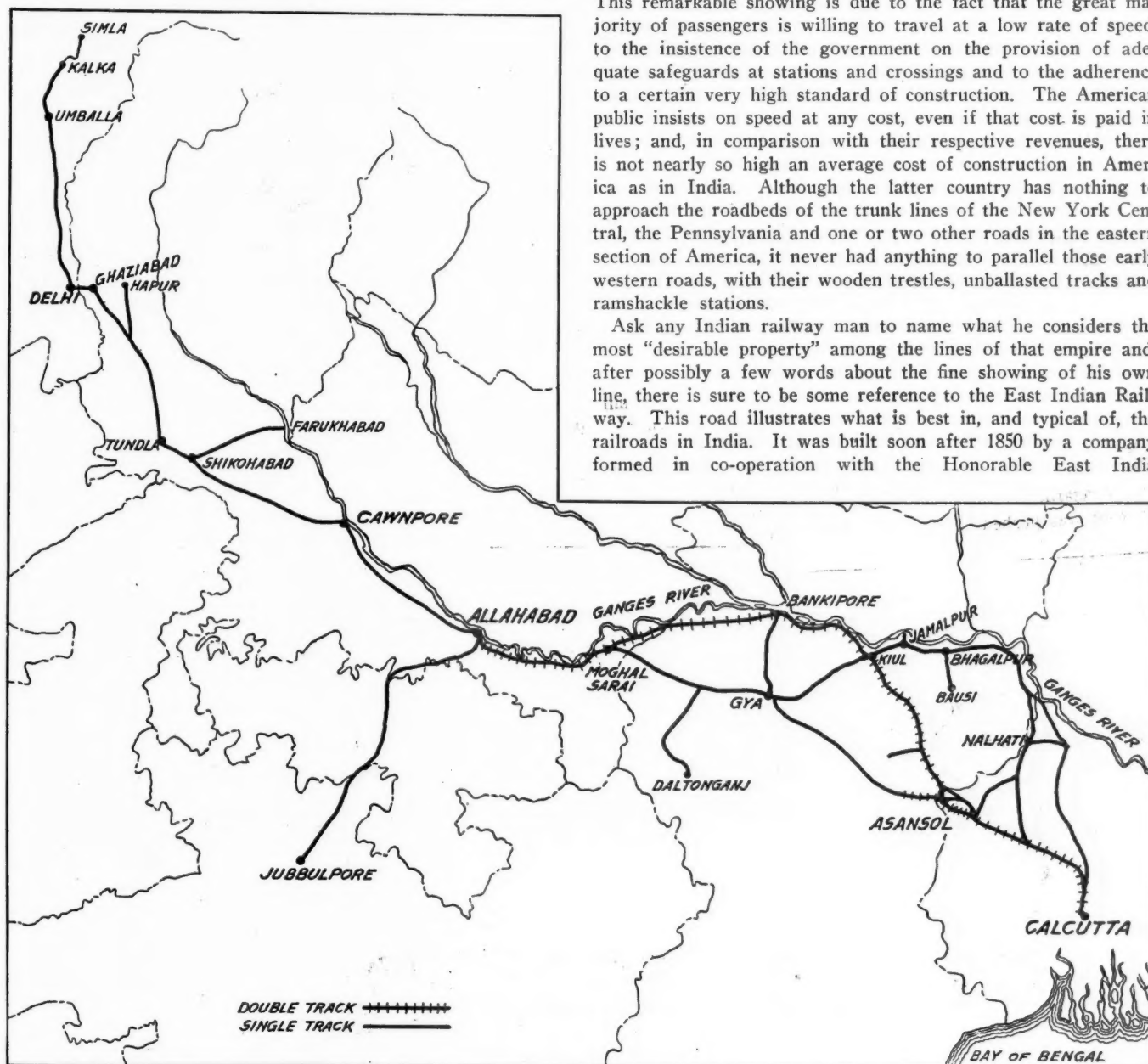
"An American railway man would probably be able to learn little in India that would be of practical use to him in his own work," a Calcutta railway official said to me a short time ago; "but, in the problems which we have solved and have still to solve, he ought to find a great deal to interest him."

India, in the past, has brought her railway ideas as she has her railway materials, from England, and there is little of either

conservative London boards and the comparative inefficiency of the native employees, rather than on account of a lack of belief in and enthusiasm for the methods themselves.

The one great thing which Indian railways accomplish better than our own is the safe carrying of passengers. Out of 371,580,000 passengers carried by the Indian railways in 1910, but three were killed from causes beyond their own control. This remarkable showing is due to the fact that the great majority of passengers is willing to travel at a low rate of speed, to the insistence of the government on the provision of adequate safeguards at stations and crossings and to the adherence to a certain very high standard of construction. The American public insists on speed at any cost, even if that cost is paid in lives; and, in comparison with their respective revenues, there is not nearly so high an average cost of construction in America as in India. Although the latter country has nothing to approach the roadbeds of the trunk lines of the New York Central, the Pennsylvania and one or two other roads in the eastern section of America, it never had anything to parallel those early western roads, with their wooden trestles, unballasted tracks and ramshackle stations.

Ask any Indian railway man to name what he considers the most "desirable property" among the lines of that empire and, after possibly a few words about the fine showing of his own line, there is sure to be some reference to the East Indian Railway. This road illustrates what is best in, and typical of, the railroads in India. It was built soon after 1850 by a company formed in co-operation with the Honorable East India



The East Indian Railway.

that America, in its present stage of railway development, could find use for. India still buys her materials in England, but for ideas she is beginning to look to America rather than the old country. Nearly every Indian railway man who has the time, tries to arrange his home leave so as to visit the United States—and one finds among those who have done so a familiarity with modern American railway methods which are rarely put in practice in India on account of the opposition of the ultra-

Company, which at that time controlled the destinies of India. Being the pioneer line in the richest part of India, the great prize of the territory of the Plains of the Ganges fell to its lot by priority of occupancy, a circumstance to which is largely traceable the pre-eminent position which the road occupies today.

To read the history of the East Indian Railway—and a very interesting record has been written by G. Huddleston, C. I. E.,

who was for many years chief superintendent of that line, and who is now at the head of the Burma Railways—is to read a large part of the history of modern India. Projected in 1845, and with the first section open for traffic in 1853, it shared with the telegraph the honor of saving India in the Sepoy rebellion of 1857. Without the hundred odd miles of line already completed when the trouble broke out it is probable that the mutiny might have taken years to suppress; with the line completed to

with renewed energy. Great difficulty was experienced in transporting materials to the intermediate centers of construction, while for a time a serious outbreak of cholera threatened to put a stop to the work altogether. For some months no less than 10 per cent. of the coolies employed died weekly, and during the epidemic it is estimated that no less than 4,000 laborers succumbed. By the end of 1861 the company had open 359 miles of line in Bengal and 243 miles in the northwest provinces, a



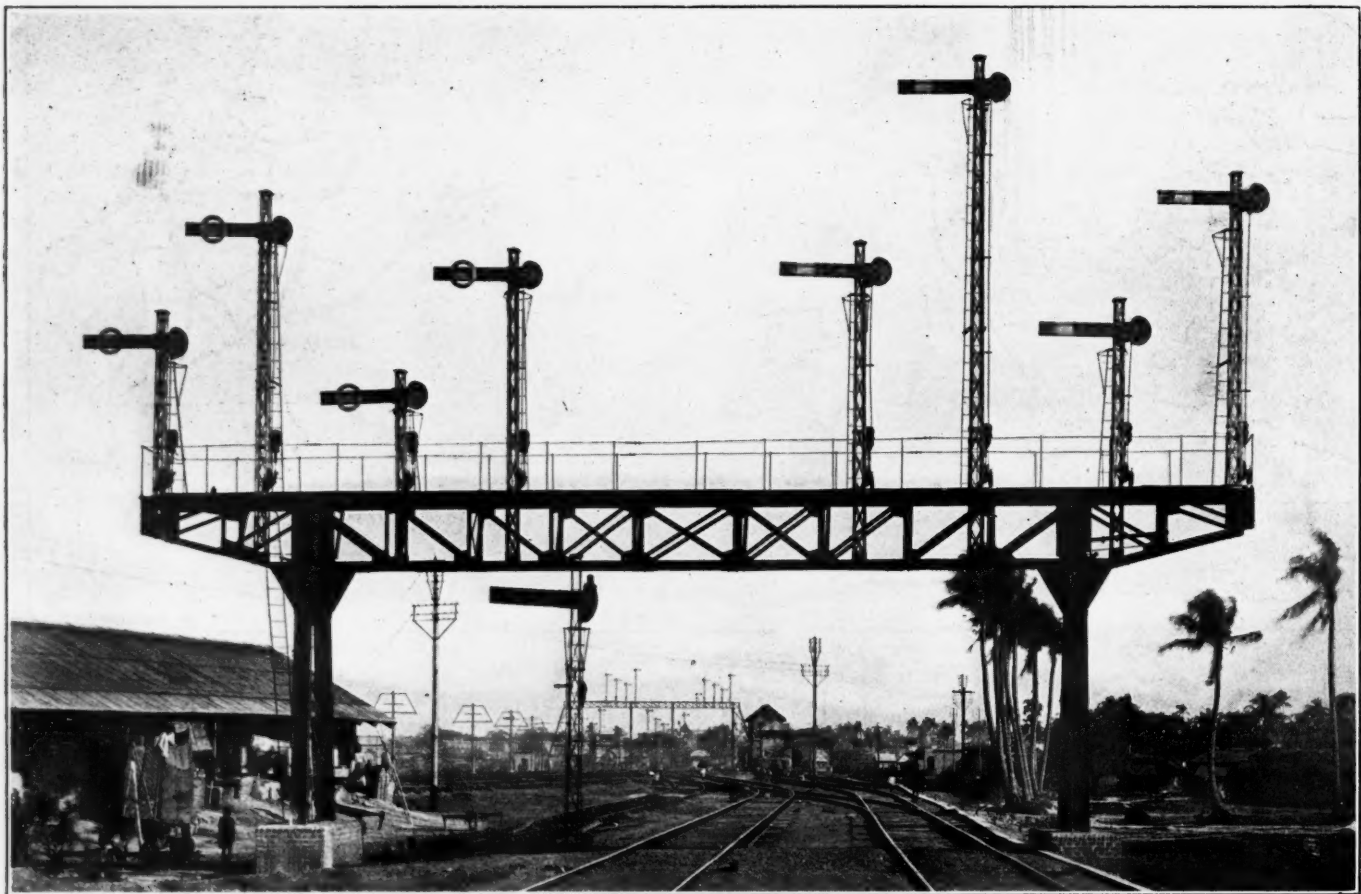
Coal Train on a Double-Track Stretch.

Delhi, or even to Cawnpore, the whole dreadful affair might have been checked before it had time to spread. A large number of the company's engineers were killed in the Cawnpore massacre, and two others especially distinguished themselves in the gallant defense of Arrah.

Construction was considerably retarded during the early days of the mutiny, but in 1858-9 work was pushed at several points

total of over 600 miles. This gave an average of 60 miles a year for the ten years during which the line had been under construction, "a record which," in the words of the viceroy of that period, "while not up to expectations first entertained, is satisfactory as regards the past and encouraging as regards the future."

At the outset the most encouraging thing was the attitude of



Semaphores at the Allahabad Yards.

the natives toward the railroad. Not only did they prove willing to come forward as laborers in satisfactory numbers, but they also displayed an amazing readiness to patronize the completed line. The figures for the first five years' business of the East Indian were prophetic not only of the success of that line, but of all the lines which were projected in a dozen widely separated sections of the empire.

In 1864, save for the break at the ferry where the Jumna bridge at Allahabad was still unfinished, passengers could travel by rail the whole 1,020 miles from Calcutta to Delhi. The latter point is the terminus of the E. I. R. proper today; so it may be said that the main trunk of the system was completed nearly fifty years ago, a long time before transcontinental communication was established in the United States. The chairman of the board, speaking in London at that time, pointed out that no line, either in England or on the continent of Europe, could compare with the main line of the E. I. R. in "magnitude or continuous length; nor could the Grand Trunk line of Can-

through a large number of populous cities in its East Indian section, and it is this, doubtless, that is responsible for the fact that, in spite of the opening of a much more direct route via Nagpur, it still remains the main line of communication between Calcutta and Bombay.

Consideration of population centers was also responsible for carrying the original line of the E. I. R. a long ways to the north of what would have been the most direct route to Delhi and the Punjab. The first section of the railway was planned to tap the Ganges at Rajmahal, but by the time construction was completed to that point the Holy river, with characteristic capriciousness, had changed its course and the importance of Rajmahal was a thing of the past. Had the plan of building in as direct a line as possible to Benares been followed it would not only have given a much shorter route to the northwest provinces, but would also have led to the discovery and exploitation of the great Jherriah coal fields forty years earlier than they were actually opened up, besides altering completely



Interior of the E. I. R. Station at Calcutta, the Largest Station in India.

ada compare with it as to works, progress or length of line." I have no figures as to the progress of railroads in the United States, but I should be surprised to learn that any one company had very much over 1,000 miles of continuous line in operation at the end of the Civil War.

It had been the original intention to permit the E. I. R. to extend on to Lahore and the frontier, but special considerations, principally strategic, prompted the government to build that line itself. It has since developed into the great 5,000-mile Northwestern Railway system, still owned and operated by the state. In this territory the E. I. R. operates, but does not own, the 162 miles of 5 ft. 6 in. gage line of the Delhi-Umballa-Kalka railway which was opened in 1891 to handle the Simla traffic.

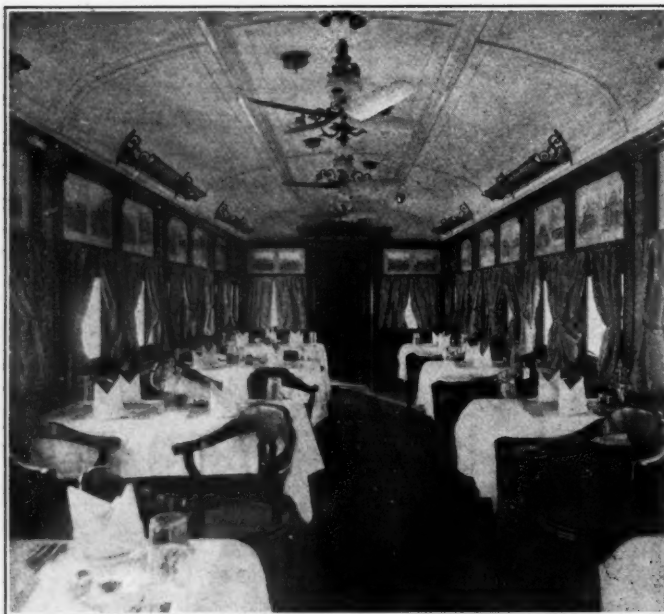
The next important event in the history of the construction of the E. I. R. was the completion of the 242 mile branch from Naini Junction, near Allahabad, to Jubbulpore, where connection with the Great Indian Peninsula Railway formed the first trans-Indian line. This route, though extremely circuitous, passed

the whole complexion of the Indian mutiny in making Benares instead of Calcutta the base of British operations. The original line still exists for local traffic, but the construction of two chords or "cut-offs" have successively reduced the distance to the northwest. Delhi, distant from Howrah (Calcutta) 903 miles by the main line, is reached in 29 hours from the latter point by the Punjab Mail, the fastest of the through trains.

The E. I. R. has been closely confined to the sphere which it occupied at the time of the completion of its main line to Delhi in 1864, and since that year its efforts have been largely directed to net-working this territory with branches, improving the existing lines and stimulating traffic. How well the latter has been done may be gathered from the following figures: In 1911 the number of passengers carried by the E. I. R. was 36,844,000, and the average journey was 58 miles. In the same year 8,508,000 tons of coal and 6,533,000 tons of merchandise were moved and the average merchandise haul was 248 miles.

The total mileage of the E. I. R. is just under 2,500, of which

about 600 are double track and 15 triple. The gage is 5 ft. 6 in. The Delhi-Umballa-Kalka and other lines operated bring the total mileage under E. I. R. management up to 2,800. The construction cost was about \$88,300 per mile. To appreciate what good construction this means one should consider that the whole line lies in a flat country, where little cutting or filling was necessary, and that it was built by the cheapest labor offered by any country in the world, not excepting China. Eighty-eight thousand dollars goes a long way under these conditions, and in the case of the E. I. R. it has found its way into a substantial roadbed, fireproof stations, well built rolling stock, and ample safety devices. The main line from Calcutta to Delhi is laid with steel rails, those on the eastern end being 85 and 88½ lb. rail. The rest of the main line and branches are laid with 75 lb. rails. A few short branches are still laid with iron rails, but these are being replaced with second-hand steel rails removed from the main line in the course of relaying operations. About 30 per cent. of the ties are wood and the remainder are iron. The wooden ties consist principally of sal and deodar; but of late jarrah and Australian hardwood ties have also been put into the road. Sal is the best of the Indian woods for ties, but, even to roads running through jungles in which the tree is found, it is sold for upwards of \$1.25 a tie. This seems a high price considering the cheapness of labor in India, but it is probably due to the fact that the trees are widely scattered. Australian sleepers for the unusually broad Indian gage will probably cost a little less than \$2 apiece. The iron sleepers are of the Denham-Olpherts pattern and weigh about 252 lbs. each. The line is stone ballasted and fenced throughout and the sharpest curve is of 1,000 ft. radius. On the main line the ruling grade is 0.3 per cent., with a 1 per cent. grade on the section between Simultala and Jhajha. On the grand chord the ruling grade is 0.5 per

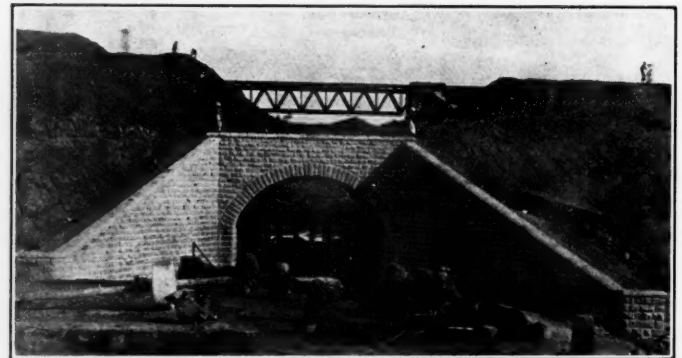


Dining Car Interior.

cent., compensated on curves, with a 1.25 per cent. grade on the section between Gurja and Gujhandi. The branches have a ruling grade of 0.5 per cent.

By the agreement with the East India Company certain conditions under which the line might ultimately be purchased by the former were laid down. These rights the Indian government, which had succeeded to them on taking over the affairs of the chartered company after the Indian mutiny, decided to exercise in 1876. The negotiations covered several years, and it was not until January 1, 1880, that the deal was completed. At this time all the contracts then existing between the secretary of state and the company were determined. The purchase price was \$163,750,000, which sum was arrived at by adding the stipu-

lated 25 per cent. premium to the market value of the company's stock at date of purchase. It was provided by the purchase act that this should be paid in the form of a terminable annuity of \$7,368,750, payable from date of purchase to 1953. One-fifth of the annuity was deferred, and the holders of this portion (representing a capital of \$32,750,000), constitute the present East Indian Railway Company, which, since the date of purchase, has operated the railway for the government. The deferred annuity holders receive, in lieu of the annuity, interest at 4 per cent. a year on \$32,750,000 and a share of the surplus profits of the railway. The terms of operation are as follows: After deducting from the gross earnings of the railway the operating expenses, the surplus profits up to a sum of \$833,000 are divided in proportion of four-fifths to the government and one-fifth to the company. Any excess over this sum is divided in proportion



Typical Culvert, E. I. R.

of fourteen-fifteenths to the government and one-fifteenth to the company.

As on other Indian railways, the E. I. R. is permitted to raise and lower fares and rates only between certain maxima and minima fixed by the government.

The location of the E. I. R. shops at Jamalpur, a couple of hundred miles from Calcutta and off the present main line, was an unfortunate result of an early change of plans. These shops had grown beyond a point which made it practicable to move them before the mistake was realized, and now, in spite of their inconvenient location, they have increased to an extent that has gained for Jamalpur the title of the "Crewe of India." The workshops cover an area of over a hundred acres, 20 of which are under roof, the whole being fenced with a high iron fence. On the score of sanitation, quarters, amusements, etc., the place is the model colony of India.

The shops are now in a position to build locomotives to meet all the requirements of the line. This work had been going on for some years, but owing to the heavy volume of repairs it was not until recently that extensions made it possible to give much attention to the building of new engines. Almost all the parts of a locomotive can now be made in the shops, including all-steel castings, and the cost of a locomotive built at Jamalpur is considerably less than one purchased and imported. The Jamalpur engines have given most satisfactory results.

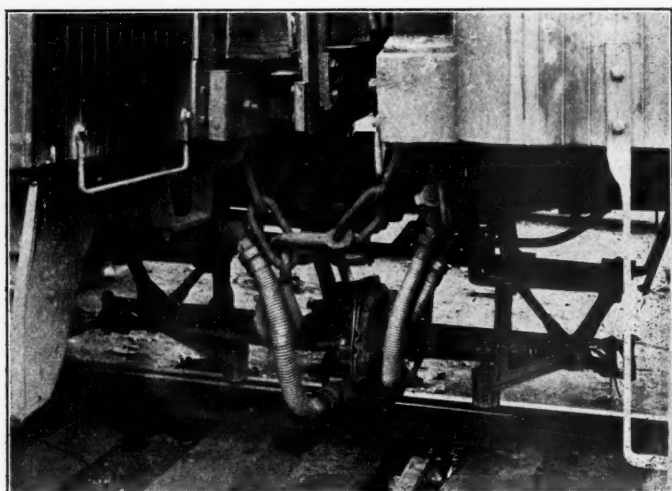
As Mr. Huddleston remarks in his valuable history of the E. I. R., there are larger railway shops existing in Europe than those at Jamalpur, but few are more self-contained or better equipped with modern electrically-driven machinery. The distance from England and the cost of freight and the accompanying delays in complying with indents for materials, etc., have been successfully overcome by the liberal and progressive policy the company has adopted in developing Jamalpur. In addition to actual locomotive work the shops undertake work for the engineering, stores, collieries and passenger car and freight car departments, and the whole of the manufacture of the Denham-Olpherts cast-iron tie, which is the standard in use on the line. All signaling and interlocking gear, posts, frames, etc., are made complete. It may be said that any general engineering work can be carried out in the shops as occasion demands.

The question of labor supply has become a troublesome one at Jamalpur, on account of the growth of the shops. It has, therefore, been necessary for some time to bring in labor daily, from a distance of 19 miles in one direction, seven in another, and six in another. Workmen's trains are run out to these places morning and evening to bring in and take back the men.

The shop plant includes a steel foundry, iron foundry, rolling mill, erecting and fitting shop, machine shops, point crossing and signal and interlocking, forge, smith, pattern, bolt and nut, brass finishing, tin and coppersmith's, cold saw, chain testing, wheel, boiler, millwright, paint and tender, and a modern and complete power house.

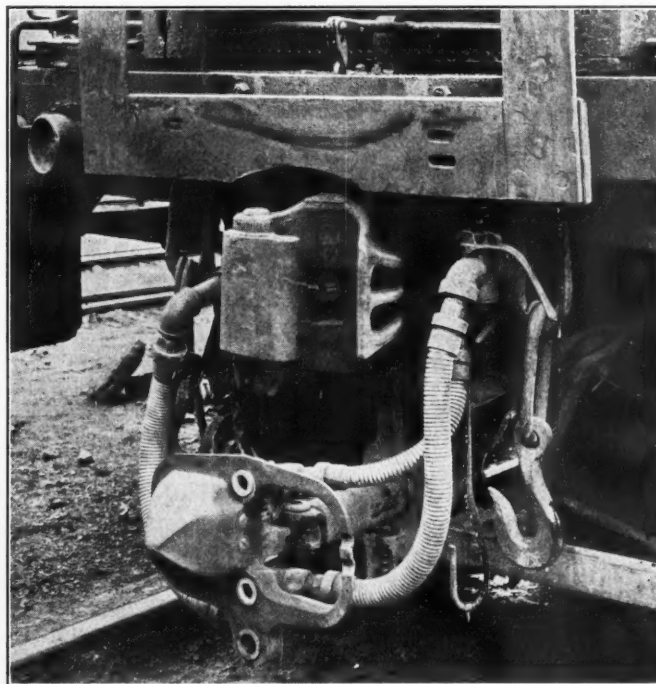
AUTOMATIC TRAIN PIPE CONNECTOR.

The Queen & Crescent has equipped its Blue Grass Special with the Durbin automatic train pipe connectors, which automatically couple the air, steam and signal lines, and also provide



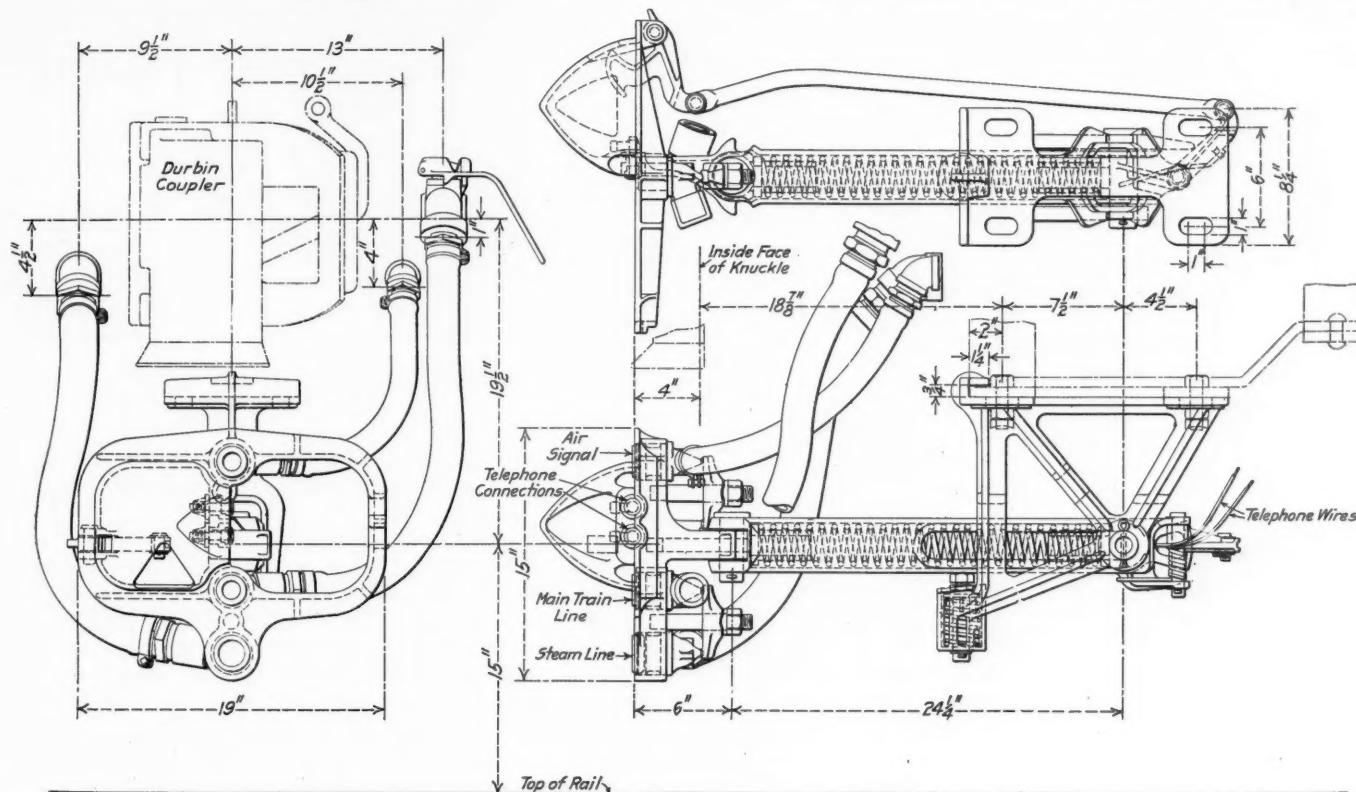
Durbin Automatic Train Pipe Connector as Connected in Service.

for telephone communication between all of the cars and the locomotive. The connector is attached to the car independent of the coupler. It is of the butt-face type and all the connections are arranged in a vertical line coincident with the center line of the car. With the butt-faced coupler the ports will register



Durbin Automatic Train Pipe Connector Applied to a Locomotive Tender.

accurately when coupling, and the gaskets will not be subjected to such severe treatment as in the side-faced type; it is also possible to keep a more perfect joint between the gaskets without relying on springs to keep the heads together. The gaskets can also be replaced without separating the cars. Having the con-



Durbin Automatic Train Pipe Connector for the Queen & Crescent.

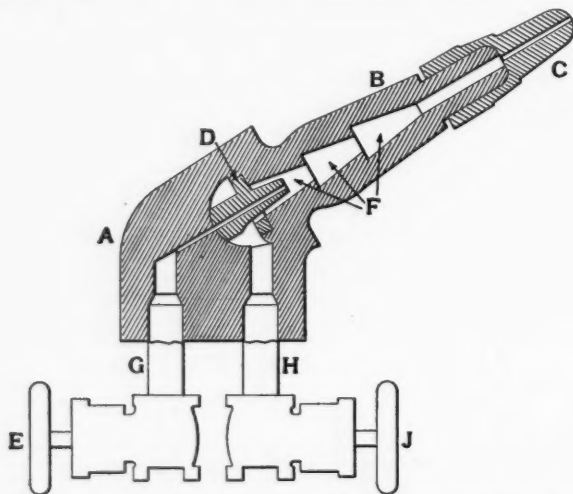
nections in a vertical line has been found to be an improvement over having them in a horizontal line, for there is less liability of the connections springing apart and creating a leak when the train is passing around a curve.

The design of the connector is clearly shown in the illustrations. It is made of malleable iron and is pivoted 6 in. behind the face of the connector to allow for the curvature of the track. It is free to move 30 deg. each side of the center, and has a vertical travel of 10 in., which is sufficient to allow for uneven track. The coupler has a gathering range of $4\frac{1}{2}$ in. in a vertical direction and 5 in. in a horizontal direction, which insures its engagement on any curve. It has a horizontal travel of 10 in., and is forced out by a spring made of vanadium steel. Even though the connectors are forced together by these springs when the cars are coupled, they also are automatically locked so that there is no possibility of their jarring open while on the road. This lock will only trip when the cars have been uncoupled and have started to separate. The hose couplings are held in the coupler head by a bridge bolt as shown in the drawing. This makes it possible for the hose coupling to be removed from the connector head for a new gasket without it being necessary to uncouple the cars. A metal gasket is used on the steam line. The plugs for the telephone connection are located between the signal line and air brake line couplings.

One of the greatest advantages of this connector is that it obviates the necessity of men going between the cars to couple the hose. It keeps the hose in an almost rigid position which will tend to reduce the hose failures due to abrasion, and on account of its construction it will practically eliminate torn hose. This device will also save considerable time in connecting up a train of cars. It is sold by the Durbin Automatic Train Pipe Connector Company, St. Louis, Mo.

WELDING AND CUTTING WITH OXYGEN AND ILLUMINATING GAS.

The success that has attended the use of high temperature gases and electricity for the welding and cutting of metals has been so marked that any development of these systems will at once prove of interest. The system which is described in this article uses a combination of oxygen and illuminating gas taken from the city mains. One of the illustrations shows the apparatus

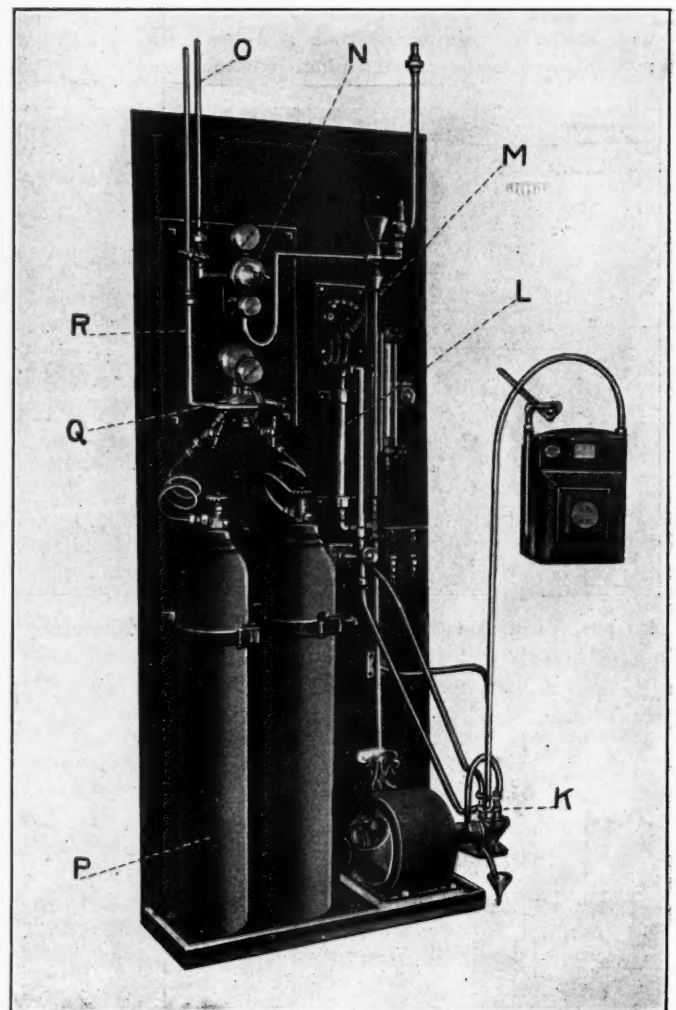


Burner for Welding and Cutting with Oxygen and Illuminating Gas.

as set up in a permanent installation, although, by the use of flexible connections a portable outfit may easily be constructed. The illuminating gas passes from the meters to a water jacketed booster *K* which is driven by a small electric motor; this booster is used to raise the pressure of the gas, its maximum capacity being 30 lbs. per sq. in., although more than 14 lbs.

is never required for even the heaviest cutting, as this pressure has proved sufficient when cutting steel bars 8 in. square. From the booster the gas passes upward through the pressure-regulating waterseal *L*, then through the pipe *M* to the pressure gage and the specially constructed reducing valve *N*, which reduces the pressure to that required for whatever class of work is being done. From the reducing valve the gas passes directly through the pipe *O* to the burner where it is combined with the oxygen.

The use of tanked oxygen, as in other welding processes, is recommended. The oxygen is stored in the tanks *P* and passes through the small coiled pipe to the reducing valve *Q*, from which it passes through the pipe *R* to the burner. The maximum pressure used in the oxygen for welding is 25 lbs. per sq. in., and for heavy cutting up to 90 and 100 lbs. The illus-



Apparatus for Welding and Cutting with Oxygen and Illuminating Gas

tration shows a two-torch outfit, but they may be built to any required size and there is one 14-torch outfit in successful operation.

The other illustration shows the construction of the burner or torch. This burner insures the complete mixture of the gases by means of the multiple stage system of mixing chambers and has been approved by the New York Municipal Explosives Commission. It will be seen that the two gases are separated until they enter the mixing chamber through the parallel ports of the transformer. Each torch is equipped with 10 tips, which are numbered and permitted a full range of work, and the ground joints facilitate the changing of the tips. Referring to the illustration, *A* is the head piece, *B* the stationary nozzle, *C* the tip, *D* the transformer, *F* expansion mixers, *G* the oxygen

conduit, *H* the illuminating gas conduit, and *E* and *J* are needle valves.

It has not yet been found possible with this system to weld either wrought iron or steel, but the welding of cast iron in medium thicknesses has proven very successful and economical. Steel and wrought iron may be readily cut by this process and steel bars up to 8 in. square have been cut with great success. The process is especially adapted for the smaller sizes of iron castings and is most economical and efficient on brass and aluminum work. It is quite applicable to such work as the repairing of brass castings, the filling in of blow holes and in boiler shops, particularly for the cutting of plates; there are also many opportunities for its use in the electric railroad repair shops as well as in signal work. The process has been developed by E. Raven Rosen-Baum, consulting engineer on high temperature gases, 607 West Forty-third street, New York, and all the apparatus has been patented by him.

AN AMERICAN IMPRESSION OF ENGLISH TRAINS.

Just then the lighter bumped against the dock. I walked under a long, low train-shed covering four tracks, and then I saw my first English passenger train. I didn't like the looks of the cars. I can prove in a moment by any traveler that our trains are vastly more luxurious. I can see where there isn't heat enough, and where one lavatory for men and women on any train, let alone a first-class one, is an abomination; but, still, and notwithstanding, I say the English railway service is better. Why? Because it's more human; it's more considerate. You aren't driven and urged to step lively and called at in loud, harsh voices, and made to feel that you are being tolerated aboard something that was never made for you at all, but for the employees of the company.

But finally the train was started, and we were off. The track was not so wide as ours, if I am not mistaken, and the little freight cars were positively ridiculous, mere wheelbarrows by comparison with the American type. As for the passenger cars, when I came to examine them, they reminded me of some of our fine street cars that run from, say, Schenectady to Gloversville. They were the first-class cars, too—the English Pullmans. The train started out briskly and you could feel that it did not have the powerful weight to it which the American

train has. An American Pullman creaks significantly, just as a great ship does when it begins to move. An American engine begins to pull slowly because it has something to pull—like a team with a heavy load. I didn't feel that I was in a train half so much as I did that I was in a string of baby carriages.

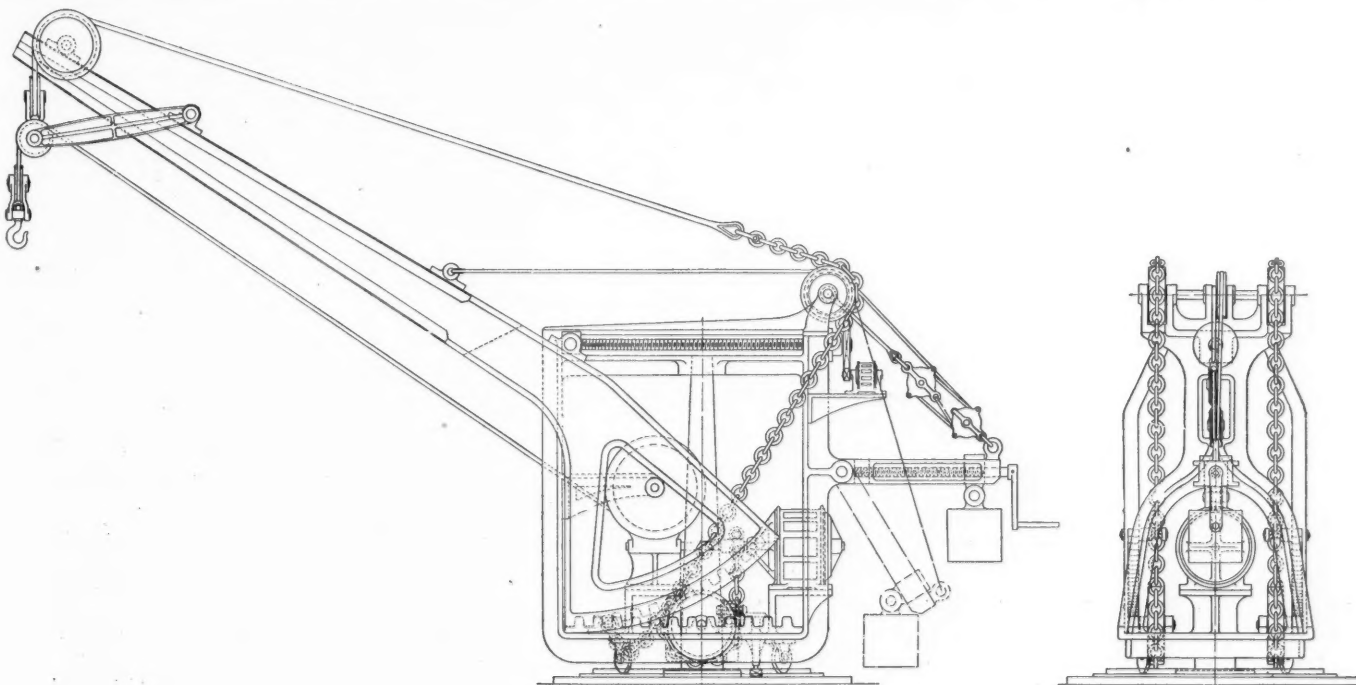
It was 3:30 when the train began to move, and from the lovely, misty sunshine of the morning the sky had become overcast with low, gray, almost black, rain clouds. I looked at the hills and valleys. They told me we were in Wales. Curiously, as we sped along, first came Wordsworth into my mind, and then Thomas Hardy.

At 4:30 one of the charming English trainmen came and asked if we would have tea in the dining car. We would. We arose and in a few moments were entering one of those dainty little basket cars. The tables were covered with white linen and simple, pretty china and a silver tea service. It wasn't as though you were traveling at all. I felt as though I were stopping at the house of a friend, or as though I were in the cozy corner of some well-known and friendly inn. Tea was served. We ate toast and talked cheerfully.—From "The First Voyage Over," by Theodore Dreiser, in the *Century* for August.

COMPENSATING QUADRANT CRANE.

The compensating quadrant crane is of the derrick type, with the jib securely fastened at its lower end to two quadrants; in the smaller cranes the jib and the quadrant are cast in one piece. The quadrant is provided with a finished rolling surface and teeth that engage in a rack and roll in a slot on the bottom plate, a frame work being built on the latter. The actuating screws work in bearings in the top connecting piece of the crane, this piece also holding the bearing at the top of the post; the bearing at the bottom of the post is a part of the bottom plate. The actuating screw swings the quadrant by means of a nut which slides on a guide on the top part of the frame. For slewing, the bottom plate is provided with four rollers that roll on a beveled flange on the post plate.

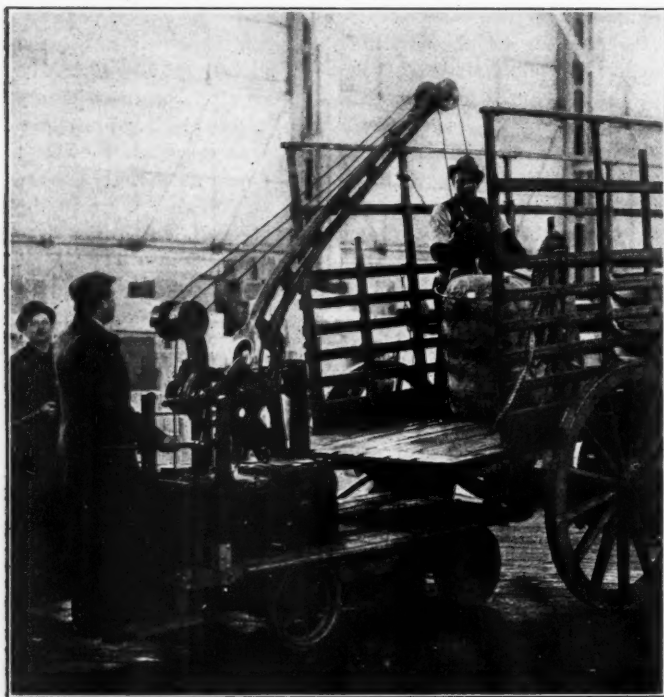
There are two different compensating devices. The first is obtained by the use of two parallel links pivoted at one end near the top of the jib, and at the other end holding two sheaves over which the hoisting ropes run. This end of the links is held by a chain that runs over the sheave at the top of the jib, and is



Compensating Quadrant Crane.

connected by means of a rod with a three-arm dog pivoted at the top of the back frame. The other two arms of the dog are connected with the lower back end of the quadrants by means of two chains running over sheaves on the bottom plate. In the second device for compensation, the fixed end of the hoisting rope is fastened to the jib at a suitable point near the top, and from this point runs back and forth over sheaves on the back part of the frame and on the top of the jib.

The hoisting machinery is of the usual kind, made of dimensions suitable for the purpose for which the crane is to be used.



Truck Crane of One-Ton Capacity.

The slewing is done by a system of gears under the bottom plate, which engage an annular rack in the post plate. The derricking is accomplished by means of the actuating screw, which is provided with a worm or spur gear drive; the necessary counterbalancing is accomplished by a weight. The driving power can be of any desired kind, but the cranes are generally provided with electric motors.

This type of crane is readily adaptable for use about scrap yards and also as a wrecking or locomotive crane. It is manufactured by the Welin Marine Equipment Company, Long Island City, N. Y.

DOUBLE TRACKING IN INDIA.—The double tracking of the Umballa-Saharanpur section of the North-Western Railway is being steadily proceeded with, and, at the same time, some of the station yards are being remodeled.

MOTOR BUSES IN LONDON.—In 1903 there were 3,500 horse omnibuses in use in the streets of London. There are now only 100 in use and it is expected that by the beginning of 1914 this type of vehicle will have been entirely done away with.—*The Engineer*.

SHIP BUILDING ON THE CLYDE.—During the first six months of 1913, the Clyde shipbuilders built 127 vessels, aggregating 348,470 tons, which is the largest output on record, exceeding the next largest output, that of the first six months of 1906, by over 12,000 tons.

EXTINGUISHING FOREST FIRES.—Ammonia bombs are being tried out on some of the national forests for the purpose of extinguishing forest fires. They are said to have worked well in the case of brush fires where the fire-fighters find difficulty in getting near enough to the burning area to beat out the flames.

General News.

Oscar Bider, on July 26, made an aeroplane flight from Milan, Italy, to Basel, Switzerland, across the Alps, 160 miles, in three hours and 45 minutes, making one brief halt at Liestal to obtain additional gasoline. He attained a height on the trip of 10,000 ft.

The motorman and conductor of the freight train which ran into a Rochester & Eastern passenger train at Victor, N. Y., on July 19, killing one man and injuring 18 others, have been arrested charged with manslaughter in the second degree, following the verdict of the coroner finding both men negligent.

Engineers, firemen and switchmen employed by the Chicago & Western Indiana and the Belt Railway of Chicago have threatened to call a strike if the roads do not meet their demands for shorter hours and a wage increase. Representatives of the unions have been in conference with the officials of the road for several days.

The White Audit System of checking passenger train collections, which was described in the *Railway Age Gazette* of January 17, 1913, page 112, at the time of its installation on the Chicago, Burlington & Quincy, is to be adopted on August 1, by the Colorado & Southern and the Chicago, Indianapolis & Louisville.

Four laborers were killed in a derailment of a car in a construction train on the Newark branch of the Erie on July 27. The train was rounding a curve at a slow rate of speed when the middle car of the seven-car train left the rails and rolled down a high embankment, carrying with it the four workmen who were riding on the load of cinders.

President Freeman, of the International & Great Northern, in commenting on the crop conditions along the I. & G. N. lines, said that a good wheat crop was harvested and an excellent corn crop made, and that Texas is looking forward to a 6,000,000 bale cotton crop, which will be the largest that has ever been produced in that state. The cotton crop is about three weeks late.

Five coaches of a Denver, Boulder & Western train were overturned at Eldorado, Col., on July 27, and 27 passengers were said to be injured, six of them seriously. The newspaper accounts of the accident say that the last coach of the train was backed off the end of the wye on which it was turning, and in an endeavor to draw this coach back on to the track, three other coaches were overturned.

Isaiah Hale, safety commissioner of the Atchison, Topeka & Santa Fe, has prepared a poster to be displayed in school houses along the company's lines, calling the attention of children to the danger of walking and playing on railway tracks. The poster includes some statistics on trespassing accidents, showing that 20 per cent. of the trespassers killed during last year were children under 14 years of age.

United States Representative Stout has introduced a bill in the lower house of Congress providing for the extension of the second class mail privilege to periodicals published by commercial clubs, chambers of commerce or other organizations not formed for profit, provided these periodicals are published only for the purpose of setting forth or advertising the products, resources or agricultural possibilities of the section in which the periodical is published.

Senator Newlands, of Nevada, has introduced a bill providing for a national waterways commission to have supervision over the expenditure of a proposed annual appropriation of \$60,000,000. The proposed commission is to consist of the president, the secretaries of war, of the interior and of agriculture, and of the chairman of the Interstate Commerce Commission, of the chairman of the Panama canal commission and of the chairman of the board of river regulation.

The Brotherhood of Railroad Trainmen and Order of Railroad Conductors on the Northern Pacific have put to a vote of their members the question of whether or not to strike unless the demands of the trainmen that suburban trainmen and conductors shall receive equal rating pay and promotion with main line employees are met. The company wishes to deal separately with employees on electric lines, while the brotherhoods desire to keep the trainmen in such service in their own organizations.

The New York *Evening Sun* is offering a prize to the commuter who can show the longest record of daily commutation into New York; another to the commuter who has made the greatest mileage in one year, and a third to the commuter who has made the greatest mileage in five years. A commuter laying claim to one of these prizes must substantiate his claim. If the *Sun* can decide the questions that will arise it will qualify to act as judge in a contest to determine what railroad has the longest piece of tangent in the world.

The management of the Missouri, Kansas & Texas has issued a circular to officers and employees announcing that the management of hospital matters will be placed in the hands of the employees contributing to the hospital fund, and two hospital associations will be incorporated, one for the main system, and one for the lines in Texas. Two boards of trustees of seven members each will be organized. The hospital fund has now accumulated a surplus of about \$100,000, which will be divided between the two associations.

Earnings of the Steel Corporation.

The report of the United States Steel Corporation for the quarter ended June 30, 1913, shows that the total net earnings were \$41,219,813 after deducting all expenses incident to operation, including those for ordinary repairs and maintenance of plants and fixed charges of subsidiary companies. This compares with \$34,426,801 for the last previous quarter and \$25,102,265 for the corresponding period of last year. This showing has not been surpassed in any quarter since the second quarter of 1907, when the net earnings amounted to \$45,503,705.

Japanese Passenger Makes Some Suggestions.

Shikaro Takomoto, "Japanese passenger," has written to the Hon. S. Pacific Company, earnestly asking why "do engineer 9:30 evening p. m. freight train necessary blow whistle with so long lasting of sounds." Takomoto, too, has some suggestions regarding Pullman cars. The letter follows:

"Dear Hon. S. Pacific:—

"I residing in these Suisun City and question, please, do engineer 9:30 evening p. m. freight train necessary blow whistle with so long lasting of sounds for calling back end brakeman if 5 short whistle call would wake my baby and back end brakeman with same effect each departure? Many other trains at crossings raise same long night noises; cannot all lives be safe with less awaking of almost the dead?

"Also recent time of late I travel with hon. employ in lovely electric lights Pullman car "Aliena" and cannot find satisfy place to lose my watch and American eagle (\$10.00) for complete safety. Could not hon. Pullman save 25c. from every gentleman in lower berth rate financial condition by inserting in smoke room wash place, one small safe deposit box convenience (10c. to porter upon arrival at destitution to leave key with it), so saving temptation of robbery under pillow.

"Thanking you for quiet relief to home and very grateful for travel safely.

Your truly,
"Shikaro Takomoto, Japanese Passenger."

The Southern Pacific has answered Takomoto and assured him that it will do all it can that "all lives be safe with less awaking of almost the dead."

Co-operation to Prevent Car Shortage.

The Sunset-Central Lines of the Southern Pacific Company have prepared a circular letter including suggestions for the prevention of car shortage, which is being sent by all local freight agents to patrons in their respective territories. The circular states that within the next sixty days another period of heavy traffic will be on us and that it will be the aim of the Sunset-Central Lines to so handle the traffic that congestion will not occur and that shippers may be assured of an adequate supply of cars. The co-operation of the shipper is necessary, however, and after discussing some of the phases of car interchange and emphasizing the necessity of such car handling as will keep the company's cars at home, the circular states that shippers may assist in some of the following ways:

By giving as much advance notice as possible of your requirements. If there is no suitable car on hand, opportunity should be given to secure it from another point.

By calling on the agent for his approval before reloading cars

made empty on your tracks. Such cars may or may not properly be used in the direction you desire, and their misuse may necessitate transfer of freight, with consequent delay to your shipment.

By loading cars to the greatest possible percentage of their capacity, and by using your efforts with your customers to induce them to place orders for full car loads. If you use two cars to handle the load of one, you reduce the supply 50 per cent.

By regulating, so far as possible, your inbound shipments so as to avoid receipt of cars in excess of your ability to promptly unload. Congestions which delay your freight and hurt your business are almost always caused by over-shipments. The effect on the car supply is also obvious.

By calling the agent's personal attention at once to any condition which retards the loading or release of cars and which it may be in the power of these lines to correct. Our own deficiencies in facilities or service may be chargeable with a detention for which you are being held responsible.

The circular also includes some extracts from the Car Service and Per Diem Rules and a list of the companies whose cars are considered "home" on the Sunset-Central Lines.

The Lazy Box Car.

The Universal Portland Cement Company has long been interested in the subject of maximum loading of freight cars, in order to obtain maximum car efficiency, and has distributed a great deal of literature on the subject to its customers. One of the company's officials, Gordon Wilson, has recently expressed the argument as follows:

Jim Bingham claims with pride that he
Is busy as a man can be;

He will not stand for loafing around his lumber yard.

The way he talks is a disgrace,

But that is just because his face,

Like all his property, must work both constantly and hard.

At times, to me, he almost seems

Inhuman, for he works his teams

Like they were made of metal 'stead of common bone and flesh.

And all his yardmen and his clerks

Full seven days a week he works,

And then acts disappointed if they aren't all keen and fresh.

One day when I dropped in on Jim,

A clean cut chap was selling him

A nifty little order of a carload of cement.

But Jim was forcing him to work

To get that order like a Turk,

And though they scrapped and argued, neither one of them unbent.

I butted in and asked them why

Their fool discussion ran so high.

And Jim explained, "This feller is gettin' fresh with me.

I want a hundred-barrel car,

And this young feller goes so far

As tellin' me I ought to buy a hundred seven three."

And then I called the salesman's bluff;

He said there were not cars enough

To carry all the merchandise that people had to ship.

And in that way he plainly showed

Why decent citizens should load

A car to full capacity each time she made a trip.

Well, then I said to Jim, "Old man,

This salesman has a little plan

That ought to make an awful hit with anyone like you.

It drives you wild when people shirk,

So why not make these box cars work

And carry every ounce of freight that they are able to."

And then Jim Bingham saw the light,

"By Gum," said he, "for once you're right,

I never thought of railroad cars in just that way before.

And after this the car for me

Will be a hundred seven three,

I won't let cars loaf on the job with my cement no more."

The Parcels Post.

The postmaster general, who, with the chairman of the Interstate Commerce Commission, went before the Senate committee on post offices and post roads, is quoted as saying that it is his intention of increasing, as soon as may be, the limit set for the weight of parcels that may go by post to 100 lbs. The Interstate Commerce Commission issued a statement in which it said that it does not consider that the provisions of the parcel post act to the effect that changes may be made by the postmaster general with the consent of the commission necessarily means that hearings should be held on such proposals of the postmaster general. The commission goes on to say that the question of compensation to the carrier for hauling mails is a matter of contract between them and the post office department, in connection with which the commission has no jurisdiction.

Lehigh Valley Wreck.

At 12:35 a. m. on July 27 a rear end collision occurred between two freight trains near Slatington, Pa., on the main line of the Lehigh Valley. The conductor of the forward train was caught in the caboose and killed, and the wreckage was thrown under the westbound passenger tracks just in front of the Lehigh Valley passenger train No. 5 from New York to Buffalo. The locomotive of the passenger train plowed through the wreckage, but was brought to a stop without any further loss of life.

Trainmen's Wage Arbitration.

On Saturday of last week the managers' committee agreed to withdraw the eight grievances of the roads which they had previously insisted should be passed upon by the arbitrators at the same time as the demands of the trainmen for increased wages and changes in working conditions. The trainmen and managers' committee thereupon reached an agreement to submit their differences to arbitration, as provided for by the amendment to the Erdman act, and it was announced by the trainmen that the two members to represent them on the arbitration board would be Lucius E. Sheppard, senior vice-president of the Order of Railway Conductors, and Daniel L. Cease, editor of *The Railway Trainman*. The two representatives of the railroads on the board are W. W. Atterbury of the Pennsylvania, and A. H. Smith of the New York Central.

Railway Mail Pay.

The committee on railway mail pay has issued a statement in part as follows:

Ninety per cent. of all the money paid to the railroads is for the weight of mail carried. The law stipulates that the mail shall be weighed for a typical period at least once every four years and that payment shall be made during the entire period according to the average weights then actually ascertained. In practice, the post office department has construed this law to mean that the mails shall be weighed not oftener than every four years. The result is that though there is a constantly increasing weight of mail, the railroads receive no payment whatever for the increase until the next quadrennial weighing period, when a basis is arrived at which shall govern the payments to be made for the succeeding four years.

An illustration of the injustice of this quadrennial weighing system is in the fact that just after the weighing of the mails in Ohio in 1907, the printing of stamped envelopes and newspaper wrappers was changed from New England to Dayton, Ohio, so that many railroads have been required to handle this traffic for four years without compensation, while other roads have been receiving for the same period compensation for services not performed. This principle is at present working great hardship to many railroads. The parcels post started January 1, 1913, and immediately there was a great increase of mail and a reduction of express matter for which the railroads had been previously paid. Congress has allowed a 5 per cent. increase in pay to compensate for the parcels post, but the records already indicate that the government's postal revenues will increase this year from 20 to 30 per cent. on account of the parcels post.

The government makes no additional payment for speed or for frequency of service. There is no greater pay accorded the

railroads for carrying mails at a speed of 60 miles per hour than for 15 miles per hour. There is no greater pay for 100 trips a day than for one trip a day. The aggregate weight of mail carried, and therefore the pay, is the same, whatever the speed or whatever the frequency with which it is carried.

To facilitate the distribution of mail en route, the railroads have provided 1,388 traveling postal cars. The mileage made by full railway post office cars of all sizes in the performance of service during the fiscal year 1912 was 126,798,405. Passenger cars on American railroads the same year yielded revenue of about 25 cents for each mile run. If the railway postal cars had yielded as much per mile, it would have amounted to a total of \$31,699,601.

Western Roads to Oppose Rate Reductions.

The presidents or receivers of twelve railways operating west of Chicago held a conference in Chicago on July 28, to consider the rate situation, and particularly the recent decisions of the Supreme Court in the state rate cases. At the conclusion of the meeting a statement was given out stating that the reduced rates have been filed under protest and that the roads propose to continue their efforts to have them increased. The statement in full follows:

"The railroads have promptly obeyed the laws and orders in Missouri, Arkansas and Minnesota reducing passenger and freight rates, which were the subject of the recent decisions by the Supreme Court of the United States.

"The 2 cent passenger fare has been put into effect in each state, as well as the reduced freight rates, but the tariffs carrying these rates have been filed under protest. In the cases of a few of the roads the claim that the rates were too low was sustained, and, while these roads were permitted to maintain their rates, and will do so, where competitive conditions may permit, the practical result of the decisions is to affect all lines alike in competitive business, which comprises the greatest part of the traffic involved.

"It must not be understood that the Supreme Court has decided any of these rates to be reasonable. The lower courts, after long and patient hearings, decided in each instance that the rates were unreasonably low, and all that the Supreme Court decided upon this branch of the cases is that further proof should have been produced by the railroads.

"Railroad men have always believed that the 2 cent passenger rate is not enough to pay for the character of passenger service demanded by modern travel, and with the increase in steel equipment, automatic block signals, high speed tracks, new passenger stations, etc., that is constantly required, this is more certainly true now than ever. The freight rate reductions are unjust and unnecessary.

"In the east the trunk lines are asking a 5 per cent. increase in freight rates, and there is much indication that public opinion favors it. West of Chicago the railroads, as a result of these decisions, are facing heavy reductions in many important rates, and there never was a time when reductions in rates were more unwise and called for with less reason than the present.

"Several of these reductions were ordered five or more years ago under conditions of public opinion that have since largely changed. In the meantime the expenses of the railroads have greatly increased, and the cost of new capital for necessary improvements has become almost prohibitive. As a consequence new construction has practically ceased, and investors are gradually withdrawing their funds from railroad securities and turning to other forms of investment.

"Believing that these reductions are not only wrong but untimely and unnecessary, the railroads have put these low rates into effect under protest and propose to continue their efforts to have them increased. New evidence will be carefully prepared to meet the suggestions contained in the opinions of the Supreme Court in case further litigation should become necessary, and consideration is also being given to an appeal to the state authorities and the Interstate Commerce Commission for relief instead of again resorting to the courts."

The statement is signed by: E. P. Ripley, president Atchison, Topeka & Santa Fe; Darius Miller, president Chicago, Burlington & Quincy; B. A. Worthington, president Chicago & Alton; S. M. Felton, president Chicago Great Western; A. J. Earling, president Chicago, Milwaukee & St. Paul; H. U. Mudge, president Chicago, Rock Island & Pacific; J. A. Edson, president

Kansas City Southern; B. F. Bush, president Missouri Pacific; F. H. Britton, president St. Louis Southwestern; C. E. Schaff, president Missouri, Kansas & Texas; C. W. Nixon, receiver St. Louis & San Francisco; F. A. Delano, receiver Wabash.

Rear End Collision on the Pennsylvania.

On July 30 westbound passenger train No. 13, on the Pennsylvania main line, ran into the rear end of westbound passenger train No. 15 near Tyrone, Pa. The engineman of No. 13 was killed and a number of passengers were injured, some of them seriously. First accounts say that No. 15 had just called in the rear flagman and was starting forward when No. 13 came around a curve about ten cars length behind the rear end.

Bulletin of Commendation and Discipline.

Following are the notices of commendation on one division of the Pennsylvania Railroad for a single month, and a few selected notices of discipline for the same month:

COMMENDATION.

Engineman commended for prompt action in stopping train after discovering board projecting from car roof.

Engineman commended for prompt action in notifying proper persons after discovering that brake rigging was down under car in passing freight train.

Engineman and fireman each commended for keeping engine in a clean condition.

Crossing watchman commended for prompt action in flagging freight train when he observed fire flying from truck of car.

Clerk commended for prompt action in notifying proper persons when he discovered, on his way home from work, truck side cracked on car standing on siding.

Leverman commended for prompt action in notifying proper persons when he discovered coal on track. (It was found that a drop bottom was down under a car in a passing freight train.)

Telegraph operator commended for prompt action in notifying proper persons when he observed a car leaning in passing freight train. (It was found that truck under car was broken.)

Telegraph operator and leverman each commended for prompt action in notifying proper persons when they discovered hot journal on car in passenger train.

Telegraph operator commended for prompt action in notifying proper persons when he observed that something was dragging under car in passing freight train. (It was found that a drop bottom was down under car and lading partly lost.)

Telegraph operator commended for prompt action in setting up route from No. 3 to No. 4 track when he thought that a freight train on No. 3 track would not be able to get stopped before fouling route set up for train No. 24 from No. 3 to No. 1 track, the freight train having run by stop signal.

Track watchman commended for prompt action in notifying proper persons when he discovered something dragging under car in passing freight train. (It was found that a hog rod was down under car.)

Air brake repairman commended for prompt action in closing down engine, in the plumbing shop, when the governor belt broke, saving the engine from possible damage and employees from personal injury.

Engine house foreman commended for designing a device for spraying hot ashes, which has proven to be efficient and a labor saver.

Engine house foreman commended for designing a stop device for pneumatic tube system of transmission of messages, which has proven useful and efficient.

Air brake inspector commended for designing an air operated clamp for holding train line feed valves to test rack, which has proven efficient as a time saver.

Gang leader commended for designing an air operated water pump for increasing the pressure on a valve testing rack, which has proven efficient.

Freight flagman commended for prompt action in having train stopped when he observed brake bar down on car in his train.

Switch tender commended for prompt action in notifying proper persons when he discovered something dragging under car in passing freight train. (It was found that brake rigging was down under car.)

Switch tender commended for prompt action in notifying

proper persons when he discovered car door open in passing freight train.

Switch tender commended for prompt action in notifying proper persons when he discovered something dragging under car in passenger train. (Train was stopped and it was found that brake rigging was down under baggage car.)

Freight conductor commended for prompt action after discovering fire in town of Blank, to warn the people by having enginemen sound whistle and taking proper steps to protect company property and notifying train despatcher.

Patrolman commended for prompt action in flagging freight train when he observed that a steam shovel had stopped on crossing on account of overhead wires, averting a possible accident.

DISCIPLINE.

Freight flagman suspended two days for throwing refuse on ground instead of putting it in garbage can.

Freight conductor suspended seven days for failing to make effort to clear obstruction from main track.

Freight conductor suspended seven days, freight brakeman suspended seven days and freight brakeman censured, for failing to give their duties proper attention and observe hot journal on car in train.

Car repairman and lamp attendant each suspended two days for operating elevator, instead of waiting for elevator attendant.

Car Repairman suspended four days for erasing inspector's marks from car without making repairs.

Passenger brakeman suspended two days for allowing lady passenger to board train in error, her destination being a point on another division.

Passenger brakeman suspended two days for leaving his train before being properly relieved at terminal.

Passenger conductor censured and passenger brakeman suspended two days for using poor judgment and lack of tact in failing to comply with a reasonable request from passenger.

Passenger brakeman suspended two days for failing to report for examination after being notified to do so.

Passenger conductor censured for failing to sign register upon arrival at Blank.

Two passenger conductors each censured for lifting transportation prematurely.

Passenger conductor suspended two days for lifting mileage in excess.

Safety First Work on the Frisco.

C. H. Baltzell, superintendent of the Ozark division of the St. Louis & San Francisco, has written for *The Frisco Man* a description of some of the methods used in reducing the number of accidents on that division 63 per cent. in the last year, which resulted in the division winning the Safety First honors for the best showing in personal injury reductions on the road. Some extracts from the statement are as follows:

I was fortunate in selecting my committee, securing men who had Safety First interests deeply at heart; men ever on the lookout for defects in equipment, as well as on the lookout for men practicing dangerous habits in their work.

Many unique methods were used to secure these good results. One at Thayer, Mo., to prevent the evil of boys hopping trains, was the installation of a platform, steps and springboard, together with a dressing room, at the old swimming hole in Warm Fork, opposite superintendent's office. I fixed this up for the boys and we all went swimming occasionally. I have counted as many as forty boys between the ages of eight and eighteen in the swimming hole at one time. I took occasion frequently to talk briefly to these boys upon the evils and dangers of hopping trains, and asked them, in consideration of fixing up the splendid swimming hole, that they would promise not to hop and ride trains through the Thayer yards; they have kept their promise.

Not only did the boys at Thayer heed the warning, but at a number of other stations along the road, where I have numerous boy friends. It has always been my practice to caution the boys about the bad habit of hopping trains, with result that during the eleven months in which we were struggling for the Safety First honors, I did not have a boy injured on the Ozark division.

At our meetings, which are held every Monday afternoon at Thayer on subjects of train rules and mechanical items of interest, the men have attended with remarkable regularity and showed their interest in these meetings by coming prepared to take active part in same.

The Safety First slogan has been kept continually before our men, and they have received it in loyal, manly spirit.

In all my athletic career no contest was ever entered into with any more spirit or determination to win than in this contest, for the principal reason that so many are benefited by results. When we stop to consider that in eleven months on the Ozark division alone, there was a reduction of 63 per cent. in the number of men hurt—and we have every reason to believe that some of them would have been fatal—the knowledge of such results, to my mind, is sufficient for any and all the work which might have been expended.

I have found in connection with this work, that in making such a strong feature of Safety First practices and habits, getting the men interested, that we have been getting their minds concentrated in the right direction. I have found that our men in all departments have become more efficient in their particular line of work, because of the great educational features of this movement.

Society of Railway Financial Officers.

The annual meeting of the Society of Railway Financial Officers will be held at the Hotel Moraine, Highland Park, Ill., September 23-25.

Demurrage in Australia.

Every trader would like to see demurrage abolished. All sorts of arguments are invented against the practice. One of the latest dodges to evade it is the request to the railway commissioners asking them not to charge demurrage on Foundation Day, which is a national holiday. The commissioners have, however, declined to consider the request. This is as it should be unless the commissioners wanted to treat the railways as a philanthropic instead of a commercial undertaking. It stands to reason that if traders did not pay their legitimate dues in order to support the railway undertaking of the state, the ordinary taxpayer would have, directly or indirectly, to subscribe to the transportation cost of merchandise of individual traders who would sell and enjoy the profits.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.
 AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass. Convention, May 19, 1914, St. Louis.
 AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York. Annual meeting, October 14-15, Philadelphia, Pa.
 AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill.
 AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, St. Louis, Mo.; 3d Friday of March and September.
 AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.
 AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOC.—H. G. McConaughy, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.
 AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York. Next meeting, November 19, 1913, Chicago.
 AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Convention, October 21-24, 1913, Montreal.
 AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago.
 AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago.
 AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—A. R. Davis, Central of Georgia, Macon, Ga.
 AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.
 AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.
 AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wenlinger, 11 Broadway, New York; 2d Tuesday of each month, New York.
 AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.
 AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Next convention, January 20-22, 1914, New Orleans, La.
 ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago. Annual meeting, May 28, Atlantic City, N. J.
 ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago.
 ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago. Annual convention, October 18-24, Chicago.
 ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 112 West Adams St., Chicago.
 ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.

ASSOCIATION OF WATER LINE ACCOUNTING OFFICERS.—W. R. Evans, Chamber of Commerce, Buffalo, N. Y. Annual meeting, October 8, Philadelphia, Pa.
 BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—H. A. Neally, Joseph Dixon Crucible Co., Jersey City, N. J. Meeting with American Railway Bridge and Building Association.
 CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.
 CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursday, Montreal.
 CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.
 CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.
 CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.
 ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.
 ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, Oliver building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.
 FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va.
 GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.
 INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.
 INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, 922 McCormick building, Chicago.
 INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 829 West Broadway, Winona, Minn.
 INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Annual meeting, August 18, Richmond, Va.
 MAINTENANCE OF WAY & MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—W. G. Wilson, Lehigh Valley, Easton, Pa.
 MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.
 MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago.
 MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Annual meeting, September 9-12, Ottawa, Can.
 NATIONAL RAILWAY APPLIANCE ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.
 NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.
 NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.
 NORTHERN RAILROAD CLUB.—C. L. Kennedy, C. & M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.
 PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria; 2d Thursday.
 RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.
 RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 2 Rector St., New York. Annual dinner, second week in December, 1913, New York.
 RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.
 RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.
 RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Mobile & Ohio, Mobile, Ala. Next meeting, October 7, Chicago.
 RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo. Next meeting, August 12-15, Nashville, Tenn.
 RAILWAY DEVELOPMENT ASSOCIATION.—W. Nicholson, Kansas City Southern, Kansas City, Mo.
 RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa. Convention, October 14, Nashville, Tenn.
 RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio.
 RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.
 RAILWAY TEL. AND TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.
 RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday except June, July and August.
 ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. Convention, September 8-12, 1913, Chicago.
 ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.
 SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meeting with annual convention Railway Signal Association.
 SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago. Annual meeting, September 23-25, Chicago.
 SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.
 SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.
 TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.
 TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillsburn, N. Y. Meeting with Roadmasters' and Maintenance of Way Association.
 TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.
 TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.
 TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.
 TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.
 TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago.
 TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.
 TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.
 TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Annual meeting, August, 1913, Chicago.
 UTAH SOCIETY OF ENGINEERS.—R. B. Ketchum, University of Utah, Salt Lake City, Utah; 3d Friday of each month, except July and August.
 WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.
 WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.
 WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News.

The Seaboard Air Line has put in regular operation the Orangeburg Railroad, which runs from North, S. C., to Orangeburg, 17 miles.

The Chicago, Milwaukee & St. Paul has announced that its new line from Plummer, Idaho, to Spokane, Wash., will be opened on Monday, September 1.

The Traffic Club of Chicago held an all-day picnic at Dellwood Park, near Joliet, Ill., on Thursday, July 31. A feature of the program was a baseball game between teams representing the Traffic Club of Chicago and the St. Louis Traffic Club.

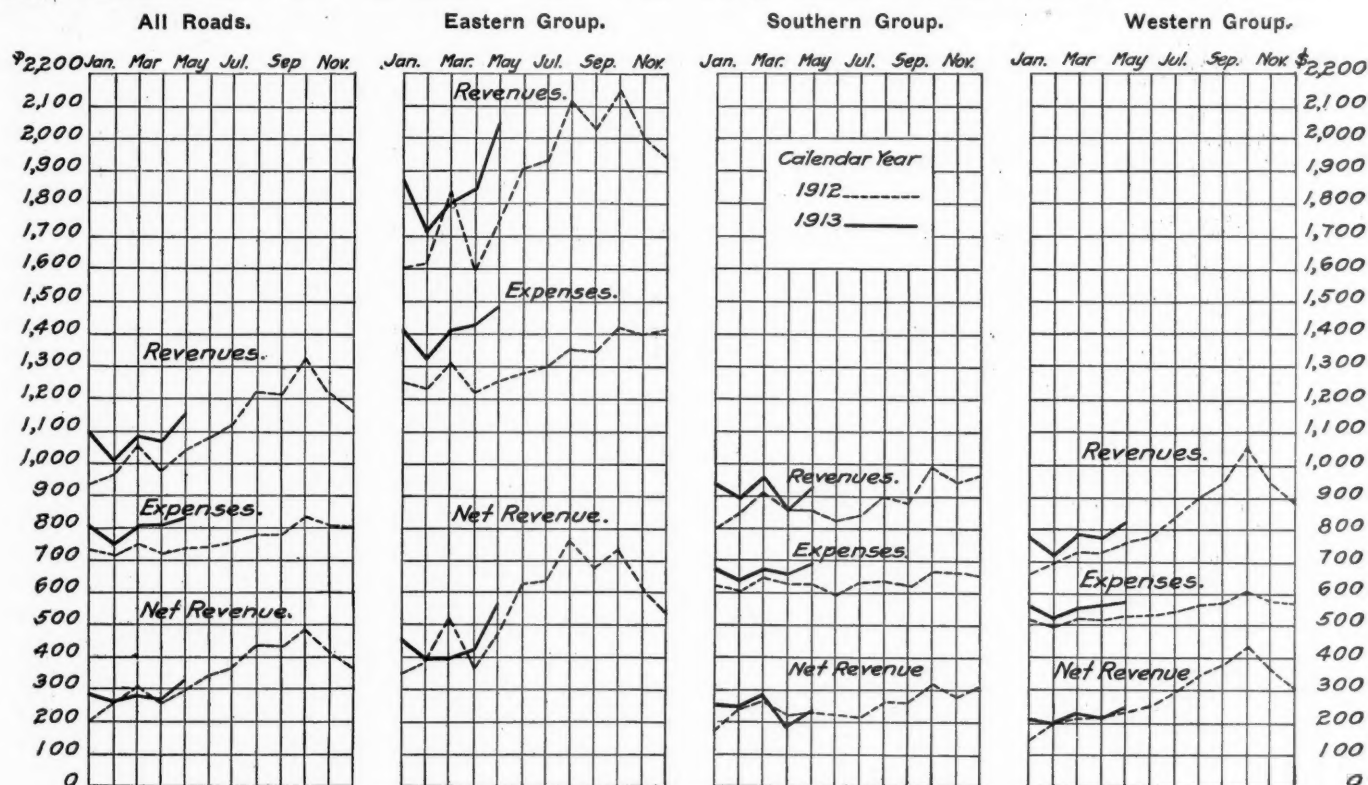
The Chicago Great Western has announced that during the present summer it will try the experiment of maintaining a three-cent fare in the State of Minnesota when other competing roads are carrying passengers at two cents a mile. The Great Western has been exempted from the operation of the two cent fare law temporarily.

At a meeting of the executive committee of the Western Passenger Association last week it was decided to refer to the

advanced freight rates at the time that it denied a reopening of the rate advance cases in 1910, might be postponed indefinitely. The proper proceeding for the railroads was to file tariffs showing increases in class and commodity rates to take effect on September 15. These increases amount to about 5 per cent. It is estimated that it will cost the eastern roads about \$250,000 to prepare the new tariffs. The commission can then refuse to permit these tariffs to go into effect, but must then give the roads a chance to justify the proposed increases.

Summary of Revenues and Expenses of Steam Roads in May.

The Bureau of Railway Economics' summary of revenues and expenses and comments thereon for May, 1913, are as follows: The railways whose returns are included in this summary operate 220,897 miles of line, or about 90 per cent. of the steam railway mileage in the United States. Total operating revenues for the month of May, 1913, amounted to \$255,127,573. Compared with May, 1912, the total operating revenues show an increase of \$29,090,461. These total operating revenues per mile of line averaged \$1,155 in May, 1913, and \$1,031 in May, 1912, an increase of 12.4 or 12.0 per cent. Freight revenue per mile increased 14.8 per cent. and passenger revenue per mile 6.2 per cent.



Monthly Revenues and Expenses Per Mile of Line in 1912 and 1913.

Pullman company a proposal to adopt some rule that will curtail the abuse of the privilege of advance reservations of sleeping car accommodations. It is proposed to adopt some plan, such as a time limit, within which reserved accommodations must be claimed and paid for, so that railways will not be left with such accommodations on their hands at the last minute after having turned away passengers because no space was available.

The Hamburg-American Steamship Company has issued a statement saying that a renewal of the North Atlantic pool agreement, which expires this year, on the present basis is a business impossibility to all the continental steamship companies, including the North German Lloyd. The Hamburg-American claims that the withdrawal of the Canadian Pacific and the Allan Line from the pool gave these companies an unfair advantage. The trouble apparently is that the Hamburg-American company wants to get as large a percentage of the immigrant traffic as is given to the North German Lloyd.

Freight Rate Advances.

The attorneys for the eastern railroads have decided that since the investigation, which the Interstate Commerce Commission announced that it would make into the necessity for

Operating expenses amounted to \$183,524,141. This was \$22,228,737 more than for May, 1912. These operating expenses per mile of line averaged \$831 in May, 1913, and \$736 in May, 1912, an increase of \$95 per mile, or 12.9 per cent.

Net operating revenue amounted to \$71,603,432. This was \$6,861,724 more than for May, 1912. Net operating revenue per mile of line averaged \$324 in May, 1913, and \$295 in May, 1912, an increase of \$29 per mile, or 9.8 per cent.

Taxes for the month of May amounted to \$10,586,402, or \$48 per mile, an increase of 6.3 per cent. over May, 1912.

Operating income averaged \$277 per mile of line, and in May, 1912, \$250, thus increasing \$27, or 10.8 per cent. Operating income for each mile of line for each day in May averaged \$8.93 and for May, 1912, \$8.06.

The operating ratio for May was 71.9 per cent., which is comparable with 75.4 per cent. in April, 1913, and 71.4 per cent. in May, 1912.

The railways of the eastern district show an increase in total operating revenues per mile of line as compared with May, 1912, of 17.0 per cent., the railways of the southern district an increase of 7.8 per cent., and the railways of the western district an increase of 8.7 per cent. Operating expenses per mile increased 16.9 per cent. on the eastern railways, 10.2 per cent. on the

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin and Minnesota lines; Group 7—Montana, Wyoming, Nebraska, North Dakota and South Dakota lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Washington, Oregon, Idaho, California, Nevada and Arizona lines; Group 11—Canadian lines.

9 (Texas, Louisiana and New Mexico). The increase in flat car surplus is in all groups, except 1 (as above), 8 (Kansas, Colorado, Oklahoma, Missouri and Arkansas), and 9 (as above). The increase in coal car surplus is in groups 2, 3 (as above), 5 (Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida); 7 (Montana, Wyoming, Nebraska and the Dakotas), and 8 (as above). The increase in miscellaneous car surplus is in groups 3 (as above); 4 (the Virginias and Carolinas); 6, 9 (as above), and 10 (Washington, Oregon, Idaho, California, Nevada and Arizona).

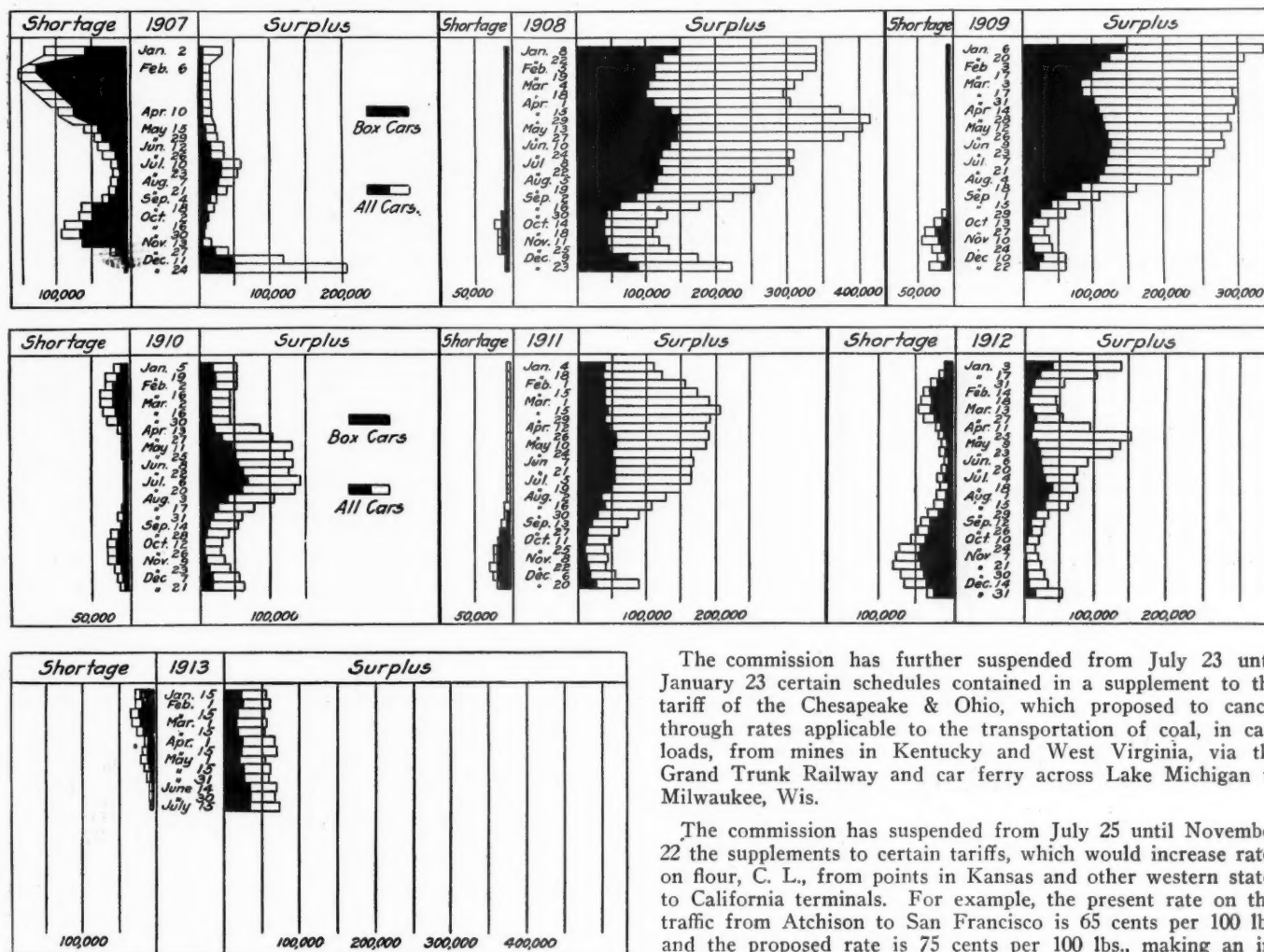
The total shortage on July 15, 1913, was 6,875 cars; on June 30, 1913, 7,036 cars; and July 18, 1912, 6,467 cars.

Compared with the preceding period; there is a decrease in

INTERSTATE COMMERCE COMMISSION.

The commission has further suspended from July 23, until January 23, 1914, certain provisions contained in a supplement to Agent F. A. Leland tariff, which proposed to cancel through rates applicable in connection with Fourche River Valley & Indian Territory Railroad.

The commission has suspended from August 1 until October 29, the item in a supplement to the tariff of the Atchison, Topeka & Santa Fe, which contains an advanced rate for the transportation of flaxseed from St. Paul, Minn., and Minnesota Transfer, Minn., to Fredonia, Kan., the present rate being 15 cents per 100 lbs., and the proposed rate 26½ cents per 100 lbs.



Car Surpluses and Shortages, 1907 to 1913.

the total shortage of 161 cars, made up as follows: an increase of 799 in box and 584 in miscellaneous, and a decrease of 549 in flat and 995 in coal car shortage. The increase in box car shortage is in groups 2, 5, 6, 7, 9 and 10 (as above). The increase in miscellaneous car shortage is in groups 1, 3, 7 and 10 (as above). The decrease in flat car shortage is in all groups, except 6 and 10 (as above). The decrease in coal car shortage is in all groups, except 9 and 10 (as above).

Compared with the same date of 1912; there is an increase in the total surplus of 891 cars, made up as follows: 2,718 in box and 1,064 in flat, and a decrease of 2,217 in coal and 674 in miscellaneous car surplus. There is an increase in the total shortage of 408 cars, made up as follows: 665 in box and 701 in miscellaneous, and a decrease of 710 in flat and 248 in coal car shortage.

The accompanying table gives car surplus and shortage figures by groups for the last period covered in the report and the diagram shows total by-weekly surpluses and shortages from 1907 to 1913.

The commission has further suspended from July 23 until January 23 certain schedules contained in a supplement to the tariff of the Chesapeake & Ohio, which proposed to cancel through rates applicable to the transportation of coal, in carloads, from mines in Kentucky and West Virginia, via the Grand Trunk Railway and car ferry across Lake Michigan to Milwaukee, Wis.

The commission has suspended from July 25 until November 22 the supplements to certain tariffs, which would increase rates on flour, C. L., from points in Kansas and other western states to California terminals. For example, the present rate on this traffic from Atchison to San Francisco is 65 cents per 100 lbs. and the proposed rate is 75 cents per 100 lbs., making an increase of 10 cents per 100 lbs.

The commission has suspended from July 31 until November 28, the tariff of the Chicago, Rock Island & Pacific, which proposed to advance rates for the transportation of wheat and grain products, c. l., from Oklahoma City and stations in Oklahoma west of that point to Memphis, Tenn. The amount of the advance proposed was 2½ cents per 100 lbs., the present rate, a group rate, being 20 cents per 100 lbs., and the proposed rate 22½ cents per 100 lbs.

Complaint Dismissed.

Franke Grain Company v. Illinois Central et al. Opinion by the commission:

The Minneapolis, St. Paul & Sault Ste. Marie Railway Company published on October 1, 1910, an index of tariffs, circulars, etc., showing Illinois Central tariff, I. C. C. A-5735, to be still in effect. The tariff had, however, been canceled December 8, 1907. On applying to the agent of such defendant in Milwaukee, the complainant was shown that company's circular above mentioned, and also the Illinois Central tariff, which showed rate of 14.75 cents per 100 lbs. from Oto and Onawa, Iowa, to Honey

Creek, Wis. Relying on the information thus obtained, complainant purchased and shipped one carload of corn from Oto and two from Onawa to Honey Creek on which rates of 21.75 cents and 20 cents, respectively, were applied. The commission decided that under the decisions of the United States Supreme Court in *Illinois Central v. Henderson Elevator Company*, 226 U. S., 441, and other cases cited, the complainant cannot recover damages on account of the failure of defendant to have the proper tariff posted at its stations; and that the record does not show that the rates charged were unreasonable.

Transcontinental Rates from Group F.

In re investigation and suspension of advances in class and commodity rates between points in Iowa and Minnesota and points in Pacific territory. Opinion by Commissioner Harlan:

In the tariffs under suspension the respondents have proposed to break up and rearrange one of the groups which the commission adopted as a basis for the rates prescribed in the Intermountain cases. Group F extends from Kansas City through Sioux City to Duluth, a distance of 693 miles. It is very long and very narrow. The respondents proposed to apply the Mississippi river rates to all points north of Sioux City to and including St. Paul and Minneapolis. This would put those points in group E. They also propose to apply the Chicago, or group D, basis to points north of the Twin Cities, to and including Duluth and Superior. This would leave group F undisturbed south of Sioux City. The change proposed would affect only the traffic moving to and from the South Pacific coast terminals, and to and from the southwestern intermountain territory; no change is proposed with respect to traffic to and from the North Pacific coast terminals. The commission decided that the proposed rates had been justified. There was no reason why Duluth should have better rates than Chicago to and from the territory in question, or why the Twin Cities should have better rates than the upper Mississippi river crossings. There is but little ground for a parity of rates to and from the southwest as between Kansas City and Duluth, which are at the two extremities of group F. The order of suspension will be vacated in respect of all of the rates except the rate on salt from Duluth to the South Pacific coast terminals. That rate was left unchanged. These findings will be subject to such modifications, if any, as may be required as the result of the action taken by the carriers in compliance with the views to be announced in *Iowa State Board of Railroad Commissioners v. A. E. R. R. Co.*, docket No. 5,241. (28 I. C. C., 1.)

Salt Rates Not Changed.

Gottson Brothers Company v. Genesee & Wyoming et al. Bruce & West Manufacturing Company v. Erie Railroad et al. Morton Salt Company v. Buffalo, Rochester & Pittsburgh et al.

Sterling Salt Company v. Pennsylvania Railroad et al. Opinion by Commissioner Harlan:

The charges made in these complaints are that the carload rates on salt, when shipped in bulk, and when shipped in packages, are unreasonable in themselves; that the rates are discriminatory when compared with the rates from Detroit, Mich., and that the higher rates in salt in packages than on bulk movements of salt are unreasonable and unduly discriminatory. Violations of the fourth section are also alleged in the case of bulk shipment only. These alleged violations of the fourth section arise out of the existence of the special rate of 10 cents per 100 lbs. on bulk salt to Chicago, and the special rate of 7 to 8 cents per 100 lbs. on bulk salt to Detroit. The specific relief sought by the complainants is the reduction of the package rate to Chicago from 14 cents to the basis of the present rate of 10 cents per 100 lbs. on bulk salt, and the scaling of the latter rate on both bulk and package salt to other destinations, to which the rates from New York field are now scaled on the 14 cent rate to Chicago. As the rate of 10 cents per 100 lbs. on coarse salt in bulk from the New York field to Chicago was compelled by water competition, the commission decided that the normal rate of 14 cents per 100 lbs. between those points, when scaled back to intermediate points in accordance with the percentage basis, does not result in discriminatory rates or in rates that are unreasonable. The commission also found that any disturbance in the rate from Detroit with the idea of lining up the rates on

course salt from the respective mines, would disturb and throw out of line the rate on evaporated salt, which is shipped not only from Detroit but many other sections. If the rates from the New York field to particular destinations are unreasonable or discriminatory as compared with rates to the same points from Detroit, the adjustment may be rectified only by an increase in the Detroit rate, as a cut in the rate to those destinations from Retsof, N. Y., would break down the percentage adjustment on salt traffic. A higher rate on salt in bulk than on salt in packages was held to be neither unreasonable nor discriminatory when the differentials are not disproportionate to the difference in transportation conditions. The shipment of coarse salt in 200 lb. sacks is not entitled to the rate published for coarse salt in bulk, as it is well understood in the salt trade that the latter phrase applies only to salt shipped without containers. The tariff of one of the defendants named the 10 cent rate from Retsof to Chicago on (coarse salt) in carloads without limiting its application to such salt when shipped "in bulk." This rate was therefore applicable to carload movements of coarse salt in sacks or packages. When this was discovered the defendants made the necessary corrections. The commission decided that this increase was justified. The complaint was dismissed. (28 I. C. C., 38.)

STATE COMMISSIONS.

The attorney-general of Arkansas has filed an intervention in the state rate litigation now pending in the federal court at Arkansas, asking that the state be awarded \$65,000 to reimburse it for its expense in carrying on the litigation involving the two cent fare and reduced state freight rates.

Engineers of the Illinois, Wisconsin and Michigan state railroad commissions have compiled a code of rules for the installation and operation of interlocking plants, which will be submitted to other commissions in an effort to have them adopted as uniform throughout the United States.

The Kansas Public Utilities Commission has given permission to the Kansas & Southwestern, a 60-mile road owned jointly by the Atchison, Topeka & Santa Fe and the St. Louis & San Francisco, to charge three-cents per mile passenger fares, on condition that \$70,000 is expended in improvements to the physical condition of the road. The order was issued on petition of communities along the line of the road.

The Illinois Railroad and Warehouse Commission is engaged on a general revision of the rules, specifications, descriptions of articles and minimum carload weights in the Illinois freight classification. The work is being done by Thomas L. Wolf, rate clerk for the commission, and the classification conference committee of the Illinois freight committee is co-operating with him. Thirty-five general rules have already been adopted, and an agreement has been reached with the railways and shippers on a large number of increases in carload minimum weights. This is the first general revision of the classification since 1906.

COURT NEWS.

A petition of the Minnesota state officials for an order directing the Chicago Great Western to put into effect for a test period of 90 days the new Minnesota passenger and freight rates, was denied by Judge Willard on July 28.

The right of any single state to regulate the power of an interstate corporation to raise funds for disbursement in various states is attacked by the Southern Pacific in a suit filed in the United States district court at San Francisco, asking an injunction to restrain the California Railroad Commission from asserting jurisdiction over a contemplated issue of equipment trust certificates to the amount of \$6,000,000.

A hearing on the application of eight railways in Iowa for an injunction restraining the state railroad commission from enforcing the rate of 1½ cents per mile for the Iowa state fair, prescribed by the last session of the legislature, was held before two judges of the United States court at Council Bluffs, on July 23. The case was taken under advisement. Representatives of the state argued that the reduced fare would increase the earnings of the roads by increasing the distance, and that

roads granted rates equally low to points outside of Iowa. The railroads attacked the law as unconstitutional and confiscatory.

The attorney-general of Texas has submitted a proposition to the Missouri, Kansas & Texas, looking to the compromise and dismissal of the suit of the state against that company for alleged violations of the anti-trust law. He stipulates that the railroads shall enter into an agreement with the state to connect its isolated line in East Texas with its main line near Waco, by building a distance of 100 miles, extending the Texas Central from Rotan to a connection with the Santa Fe at Fuller, 50 miles, and that all contracts between the Missouri, Kansas & Texas of Texas, and the Missouri, Kansas & Texas of Kansas shall be submitted to the Texas railroad commission for approval before they become effective.

The attorney general of the United States has brought suit in the district court at Portland, Ore., against the American Telephone & Telegraph Company and some of its subsidiaries, claiming that these companies have violated the provisions of the Sherman law in creating a monopoly in Oregon, Washington, Montana and Idaho. It was announced by the department of justice that this proceeding was brought to correct an exceptional condition and would not in any way interfere with the broad investigation of telephone conditions throughout the entire country undertaken by the Interstate Commerce Commission at the suggestion of the former attorney general. Theodore N. Vail, president of the American Telephone & Telegraph Company, gave out a statement in which he said that the facts in the case would not be contended, but that his company relied upon being able to show that the facts as presented by the government did not constitute a violation of the anti-trust law.

CANTON-HANKOW RAILWAY, CHINA.—The associate director of the Canton-Hankow and Hankow-Szechuan railways, Dr. Jeme Tien-yew, arrived at Hankow early in May to arrange for the commencement of construction work. He stated that money was available for the construction of the British section, and that he expected work to begin immediately. The first work to be undertaken will be to complete the purchase of the land, then to make the earthwork. The only material that has been ordered up to the present is the telegraphic material.

NEW RAILROADS IN CUBA.—A railroad is projected from Placetas to Trinidad, Santa Clara province. Trinidad is one of the oldest towns of Cuba and one of the most picturesque. It is, however, entirely cut off from railroads and has thus lost much of its importance. A railroad from Caibarien to Mayajigua, in Santa Clara province, is about ready for service. The Narciso Sugar Central is largely interested in the road, which will permit direct transportation of its sugar to Caibarien on the north coast. A \$300,000 railway from the Socorro sugar mill, in Matanzas province, to Playa Liza, in the Cienega de Zapata, is planned by Sr. Pepro Arenal, owner of the mill.

CHILEAN RAILWAYS.—The competition which was threatened for the Antofagasta Railway when the Arica-La Paz was completed has hitherto had no appreciable effect upon the business carried on by the admirably conducted and efficiently equipped line which serves the sister states of Chili and Bolivia. For some years past the receipts derived from all sources have shown a consistent expansion; for the past twelve months they have been particularly good. The future seems even more rosy yet, for several fresh channels of usefulness have been opened, such as a revival in the tin-mining industry, and the improvement in the copper-mining operations of Chili. It is true that working expenses have marked an unpleasant advance, comparing, in this respect, very adversely with those of the previous years, and especially with those of 1911. This is not at all difficult, however, to understand. Firstly, passenger traffic has considerably augmented; secondly, the roadbed has called for a large amount of exceptional outlay; while, thirdly, coal has increased very much in price, and will probably advance still further. The fuel bill alone accounts for about 14 per cent. of the working expenses of this railway. The directors, it is understood, are in favor of introducing oil-fuel to a large extent, but before the local management can endorse this policy it will be desirable to continue for some time yet the experiments which have been in hand for the last 12 months.

Railway Officers.

Executive, Financial and Legal Officers.

W. C. Chisholm, K.C., has been appointed general solicitor of the Grand Trunk, with headquarters at Montreal, Que. W. E. Foster has been appointed solicitor and will take charge of such matters arising in the province of Ontario as may be assigned to him.

J. Nicholson has been appointed auditor of disbursements of the Galveston, Harrisburg & San Antonio, Houston & Texas Central, Houston East & West Texas, Houston & Shreveport and the Texas & New Orleans, with headquarters at Houston, Tex.; effective August 1.

Operating Officers.

S. L. Kamps has been appointed inspector of transportation of the Chicago Great Western, with office at Chicago.

M. Dailey has been appointed general manager of the Muscatine North & South Railway, with headquarters at Muscatine, Iowa, in place of H. B. Holbert, resigned.

The headquarters of W. T. Tyler, general manager of the St. Louis & San Francisco, have been removed from Springfield, Mo., to St. Louis; effective August 1.

Richard L. Barrett has been appointed trainmaster of the Pittsburg, Shawmut & Northern, with office at St. Mary's Junction, Pa., succeeding J. T. Colbert, promoted.

T. J. Hayes, trainmaster of the Cleveland, Cincinnati, Chicago & St. Louis at Cleveland, Ohio, has been appointed superintendent of terminals at Cincinnati, Ohio. P. T. White, trainmaster at Springfield, Ohio, succeeds Mr. Hayes, and O. C. Wyman, trainmaster at Wabash, Ind., takes the place of Mr. White.

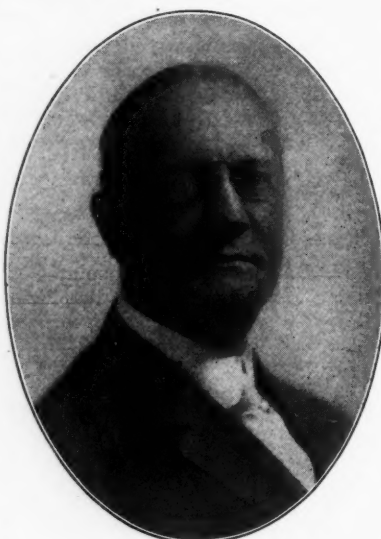
George H. Schleyer, one of the receivers of the St. Louis, San Francisco & Texas and the Ft. Worth & Rio Grande, assumes the title of general manager in addition to his duties as receiver, with headquarters at Ft. Worth, Tex. W. E. Livingston, trainmaster of those roads, is appointed superintendent and G. A. Chandler, car accountant, is appointed superintendent of car service, both with headquarters at Ft. Worth, and the offices heretofore held by them are abolished. Effective July 21.

C. O. Jenks, who recently was made general superintendent of the Lake district of the Great Northern, with headquarters at Superior, Wis., as already announced in these columns, was born March 6, 1874, at St. Paul, Minn. He was educated at the University of North Dakota, and began railway work in June, 1891, as clerk in the superintendent's office of the Great Northern. He was successively chief clerk, trainmaster, assistant superintendent and superintendent of various divisions until October, 1906, when he became president and manager of the Nelson-Jenks Company of Great Falls, Mont. In December, 1909, Mr. Jenks returned to active railway service as superintendent of the Butte division of the Great Northern. He was promoted to general superintendent of the Central district in March, 1912, which position he held until he was appointed general superintendent of the Lake district on July 20, as above noted.

Alfred Price, whose appointment as assistant general manager of the Canadian Pacific, with headquarters at Montreal, Que., has been announced in these columns, was born on December 6, 1861, at Toronto, Ont., and was educated in the public schools of his native town. He began railway work in September, 1879, and was consecutively operator, messenger and clerk, and car accountant on the Credit Valley Railway until 1882, and was then operator and relief despatcher of its successor, the Canadian Pacific, at Toronto, since which time he has been in the continuous service of that road. From 1884 to July, 1888, he was train despatcher at the same place, and was then car distributor until May, 1896, when he became car distributor and chief despatcher. In August, 1898, he was appointed superintendent at Toronto, and in May, 1903, was transferred in the same capacity to Fort William, Ont. He was appointed superintendent of transportation, western lines, in August, 1904, at Winnipeg, Man., and in March, 1907, was promoted to general superintendent.

ent of the Central division at the same place. On December 1, 1907, he was made general superintendent of the Alberta division with headquarters at Calgary, Alta., which position he held at the time of his recent appointment as assistant general manager of the same road, with headquarters at Montreal, as above noted.

H. A. Worcester, whose appointment as general manager of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Cincinnati, Ohio, has already been announced in these columns, was born November 18, 1862, at Albany, N. Y. He is a graduate of Yale University, and began railway work in December, 1885, with the New York Central & Hudson River as assistant stationmaster at the Grand Central station in New York City. In August, 1891, he entered the service of the Lake Shore & Michigan Southern at Buffalo, N. Y., as clerk, and one year later he was made assistant trainmaster of the Franklin division, from which position he was advanced to superintendent of the Lansing division in February, 1893. In June, 1896, Mr. Worcester was transferred to the superintendency of the Detroit division, where he remained until November, 1902, when he was made superintendent of the Eastern division, and in February, 1905, he was placed in charge of the Western division for three months as superintendent. He then went to the Michigan Central in April of that year as assistant general superintendent and was promoted to general superintendent in November. He returned to the Lake Shore in February, 1906, as general superintendent and the following October was made assistant general manager of the Cleveland, Cincinnati, Chicago & St. Louis, which position he held at the time of his recent appointment as general manager, as above noted.



H. A. Worcester.

Traffic Officers.

D. M. Middleton has been appointed commercial agent of the Lehigh Valley, with headquarters at New York.

Leslie Rawls has been appointed special representative of the traffic department of the Western Maryland, with office in Baltimore, Md.

The headquarters of C. Hanson, joint general livestock agent of the International & Great Northern and the Texas & Pacific, have been moved from Ft. Worth, Tex., to San Antonio.

William A. Wallace has been appointed traveling freight agent of the Erie, with office at Reading, Pa. Ira S. Auch has been appointed general agent with office in Philadelphia, Pa., succeeding Mr. Wallace.

W. C. Preston, general freight and passenger agent of the St. Louis, San Francisco & Texas and the Ft. Worth & Rio Grande, is appointed traffic manager, with headquarters at Ft. Worth, Tex., and the former office is abolished; effective July 21.

Albert Davidson has been appointed general agent of the Grand Trunk Pacific and the Grand Trunk in charge of passenger and freight traffic in western British Columbia, north of Rivers Inlet, including Queen Charlotte islands, succeeding A. E. McMaster.

Howard C. Montague has been appointed commercial agent of the Georgia Southern & Florida, with office at Chattanooga, Tenn., succeeding James F. Slowey, resigned. Harold L. Peters has been appointed soliciting freight agent at Tampa, Fla., effective August 1, succeeding Mr. Montague.

C. H. Todd, general agent of the Western Maryland at Indianapolis, Ind., has been appointed traveling freight and passenger agent, with headquarters at Elkins, W. Va., and H. E. Williams has been appointed general agent, with office at Baltimore, Md., succeeding C. H. Porter, assigned to other duties. Effective August 1.

Fred R. Porter has been appointed general freight agent of the Grand Trunk Pacific, with office at Winnipeg, Man., succeeding R. J. Foreman, who has accepted service with the Grand Trunk Railway. F. G. Adams has been made division freight agent at Edmonton, Alta., succeeding Mr. Porter. A. E. McMaster has been made commercial agent at Regina, Sask., succeeding Mr. Adams.

W. J. Frost, traveling passenger agent of the Missouri Pacific at Cincinnati, O., has been transferred to Indianapolis, Ind., in a similar capacity, in place of C. D. Boyd, resigned to engage in other business. Lee B. Scheurer, city passenger agent at Cincinnati, succeeds Mr. Frost. G. M. Trickett has been appointed traveling passenger agent, with office at Little Rock, Ark., in place of W. H. Glover, who has been transferred to Chicago as traveling passenger agent in place of I. M. Keller, resigned to enter other business.

Edward M. Kain, whose appointment as assistant general freight agent of the Erie, with office at Buffalo, N. Y., has been mentioned in these columns, was born on August 16, 1866, at Elmira, N. Y. Mr. Kain began railway work in 1884 in the service of the Erie, and has been with that company ever since. He was stationed at various places, including Binghamton, N. Y. On January 12, 1905, he was made division freight agent at Elmira, which position he held until July 15, 1913, when he was made assistant general freight agent as mentioned above.

Arthur Campbell Shaw, whose appointment as general passenger agent of the Canadian Pacific, with office at Winnipeg, Man., has been mentioned in these columns, was born at Detroit, Mich., May 12, 1865. He was educated at the Normal school, Toronto. He entered railway service in 1880 with the Great Western Railway of Canada. From 1882 to 1886 he was engaged in other business, but on March 13, 1886, he again took up railway work in the office of the district passenger agent of the Canadian Pacific, at Toronto. On December 1, 1886, he was transferred to the office of the general passenger agent at Montreal, Que. On December 1, 1900, he was transferred to the office of the general agent of the passenger department at Chicago. On November 1, 1910, he was made assistant general passenger agent, with office in Winnipeg, which position he retained until July 1, 1913, when he was made general passenger agent as mentioned above.

Engineering and Rolling Stock Officers.

W. T. Leyden, master mechanic of the Minneapolis & St. Louis, with headquarters at Marshalltown, Iowa, has resigned.

W. C. Groening has been appointed master mechanic of the Pere Marquette, with office at Wyoming, Mich., succeeding J. E. Hickey, resigned.

J. J. Daily has been appointed roadmaster of the first district of the Oregon Short Line, with headquarters at Kemmerer, Wyo., in place of John McGreevey, resigned.

J. C. Mill, assistant signal engineer of the Chicago, Milwaukee & St. Paul, has been appointed signal engineer, with office at Milwaukee, Wis., succeeding A. Brown, deceased; effective August 1.

George Thomson, division general foreman in the car department of the Lake Shore & Michigan Southern at Englewood, Ill., has been appointed assistant master car builder, Michigan Southern division of that road, also of the Chicago, Indiana & Southern and the Indiana Harbor Belt, with headquarters at Englewood.

Charles Edward Smith, whose appointment as assistant chief engineer of the Missouri Pacific, with headquarters at St. Louis, Mo., has already been announced in these columns, was born August 20, 1877, at Somerville, Mass. He was educated at the Massachusetts Institute of Technology, and began railway work in June, 1897, as rodman on the New England Railroad at Boston, Mass. From June, 1898, to September, 1899, and from June to November, 1900, he was assistant city engi-

neer at Putnam and Willimantic, Conn. Later until September, 1903, he was draftsman and bridge designer for the New York, New Haven & Hartford at New Haven, Conn. The following six months he was with the Bureau of Yards and Docks of the Navy Department at Washington, D. C., as steel draftsman. Mr. Smith returned to railway service in March, 1904, as assistant bridge engineer on erection and inspection work for the Lake Shore & Michigan Southern at Cleveland, Ohio. In March, 1905, he went to the International Correspondence Schools as text book writer, leaving in December of the following year to become technical editor, structural materials division, U. S. Geological Survey. He entered the service of the Missouri Pacific in August, 1907, as assistant engineer on general work in the maintenance of way department at St. Louis, Mo. On September 1, 1909, he was made bridge engineer, which position he held at the time of his promotion to assistant chief engineer, as above noted.

Purchasing Officers.

Samuel Porcher, assistant purchasing agent of the Pennsylvania Railroad, with office in Philadelphia, Pa., has been appointed purchasing agent, with office in Philadelphia, succeeding Daniel S. Newhall, deceased.

OBITUARY.

Anthony N. Brady, chairman of the board of directors of the Brooklyn Rapid Transit Company, died in London, England, on July 22, at the age of 71. The directors of the Brooklyn Rapid Transit Company adopted a resolution relating to his death, which is in part as follows: "For seventeen years he has been actively concerned in the direction of the company's business. During all of that period he has shown unceasing interest in its growth and development, manifesting that interest not only in the devotion of service and talents to its affairs, but in his large investments in its securities. Never for an instant has his faith in its success or his loyalty to its welfare wavered."

Arthur S. Hanson, general passenger agent of the Boston & Albany, with office in Boston, died on July 28, at the age of 61. Mr. Hanson was born in Salem, Mass., December 31, 1851. After studying at St. Mark's school, at Southboro, Mass., he spent three years in Boston in the mercantile business. In 1872 he went to Chicago and entered railway work in the service of the Illinois Central. On December 1, 1878, he entered the passenger department of the Boston & Albany, with which company he has been continuously associated ever since. He was appointed assistant general passenger agent on February 1, 1882, and general passenger agent on December 1, 1884, which position he held at the time of his death.

Edward A. Taft, manager of the express department of the New York, New Haven & Hartford, died on July 29 at his home in Boston. Mr. Taft was born in 1845, and served as captain's clerk on the gunboat *Cambridge* and the sloop of war *Tuscarora* in the civil war. He began as clerk with the Merchants' Union Express Company in 1866, and was later made auditor of the New England Express Company, and in 1886 was made a member of the board of managers of the Erie Express, which later was merged with Wells, Fargo & Company. He later became a director and president of the rector and chairman of the board of the Manhattan Delivery Morris European & American Express Company, and a director of the Company.

THE CHEFOO-WEIHSIEN RAILWAY, CHINA.—The surveying corps have finished the surveying of the line from Chefoo to Weihsien, a distance of 200 miles.

PRIZES FOR NEAT HOMES IN VICTORIA.—In addition to other prizes awarded to the Victorian Railway employees, it was decided some time ago to award prizes to the workmen for neat homes. The competition was arranged so as to encourage workmen in the habit of keeping hygienic homes and improving them by laying out gardens, planting trees, etc. On the Victorian railways three prizes are given annually in each of the seven districts in the state, as follows: \$30 for the first; \$15 for the second, and \$5 for the third.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

THE MONONGAHELA has ordered 6 consolidation locomotives from the American Locomotive Company. The dimensions of the cylinders will be 21 in. x 30 in., the diameter of the driving wheels will be 51 in. and the total weight in working order will be 194,000 lbs.

CAR BUILDING.

THE ATLANTIC COAST LINE is in the market for 25 phosphate cars.

THE NEW YORK CENTRAL LINES are in the market for about 300 passenger cars.

THE CHICAGO, BURLINGTON & QUINCY is in the market for 15 combination baggage and mail cars and 10 mail cars.

IRON AND STEEL.

GENERAL CONDITIONS IN STEEL.—There has been a marked improvement in the buying movement during the past week. This is largely due to the greater confidence that is felt in the crop prospects. Consumers are now entering the market and are placing large orders for new business which had been held in abeyance for some time. The improvement has compensated partially for the sharp falling off in business and in production early in July. Prices are firm and the mills are operating at about 90 per cent. of their capacity. There are enough orders on the books to keep the mills running at this capacity for three or four months.

FORESTRY IN FRANCE.—France has spent \$35,000,000 in planting trees on the watersheds of important streams.

SOUTH AUSTRALIAN RAILWAYS.—Railways were early in starting in South Australia, the first one, between Adelaide and Port Adelaide, being opened in 1856, with the Victorian gage of 5 ft. 3 in., which was continued on the main lines connecting with Victoria.

REPORTING FOREST FIRES.—The Western Pacific has instructed its engineers to report fires along the right-of-way where it traverses the Plumas national forest in California. The location of fires is indicated on a card dropped by the engineer or fireman to the next section crew met after the fire is discovered. It is then the duty of part of the section crew to go back on hand-cars or speeders and put out the blaze.

STEAM FOR CAR NAVIGATION.—Benjamin Phillips, architect, of Philadelphia, proposes to construct a steam car to travel on rivers at a speed of 20 to 25 miles per hour to carry one hundred passengers, to draw 15 in. of water, to be only one-third the weight of any other ordinary steamboat of the same dimensions now afloat; of far superior strength and safety, constructed on entirely new principles; the whole material except the engine and boiler to cost about \$1,600 completely furnished and ready for operation by the first day of May next.—*From the American Railroad Journal for January, 1833.*

EARLY RAILROAD TRAVEL.—We are requested to state that there has not been a day since the opening of the Camden & Amboy Railroad that the Philadelphia and New York passengers have not been taken over the road each way with the exception of Saturday and Monday last, notwithstanding the recent heavy falls of snow. On those days there were no passengers from Philadelphia, owing to the company's not being able to procure coaches to convey passengers from Philadelphia to the railroad. The passengers that left New York on the above-mentioned days were taken over the railroad in cars and forwarded to Philadelphia the same evening in sleighs. The stage arrangements being now completed, passengers will be conveyed from the railroad to Philadelphia in coaches until the river Delaware opens.—*From the American Railroad Journal, March 9, 1833.*

Supply Trade News.

F. E. Hutchison, who recently resigned as chief electrician of the Chicago, Rock Island & Pacific, was appointed at that time sales manager of the Moon Manufacturing Company, of Chicago.

The National Tube Company, Pittsburgh, Pa., has contracted with the National Metal Molding Company and the Safety-Armorite Conduit Company, both of Pittsburgh, to manufacture and sell electrical conduit for it as its agents, under their various brands.

Eighteen minority stockholders of the Union Car & Equipment Company, Chicago, have applied to the United States Circuit Court at Chicago for the appointment of a receiver for the company, alleging that the company's affairs are involved and that it has ceased to do business.

Harrison G. Thompson, manager of the railway department of the Edison Storage Battery Company, Orange, N. J., has been made a vice-president of that company. Mr. Thompson was born in Weston, Mass., in 1875. His railroad experience began with the Pullman Company in 1896. When he had been with that company for two years he was made foreman of electricians. In 1900 he resigned to become foreman of the battery department of the Riker Motor Vehicle Company. Leaving this concern at the time of its absorption by the General Vehicle Company of Hartford, Conn., Mr. Thompson became associated with W. L. Bliss, one of the pioneers in electric car lighting development. He resigned from the Bliss Company in 1905 and went to the Pennsylvania Railroad where he was in charge of electric car lighting with headquarters at Jersey City, N. J. In 1906 he went to the Safety Car Heating & Lighting Company, New York, as electrical superintendent. He was in charge of this company's electrical laboratories during the development of its first electric car lighting system. In December, 1909, he was appointed manager of the railroad department of the Westinghouse Storage Battery Company. He was later with the United States Light & Heating Company, New York, for a short time. On July 1, 1910, he was made manager of the railway department of the Edison Storage Battery Company, which position he held until his appointment as a vice-president as mentioned above. He is a member of the executive committee of the Telephone and Telegraph Appliance Association, and for three years was vice-president of the Association of Railway Electrical Engineers.

Ground was broken on July 23, for the new plant of the Baldwin Locomotive Works in East Chicago. The plant is to be built in several units, the first unit to occupy a building 1,400 x 600 ft. of concrete and steel. The H. A. Strauss Company, of Chicago, has the contract for the construction of the concrete work on the first unit.

W. F. Girtan, representative of the railroad department of the Garlock Packing Company in Eastern territory, and formerly general storekeeper of the Central of New Jersey and of the Delaware, Lackawanna & Western, died at the Presbyterian Hospital, Newark, N. J., on July 27, of a complication of intestinal and stomach troubles. The funeral was held on Tuesday.

On Monday, July 28, the General Electric Company had on exhibition at Schenectady, N. Y., the control apparatus for the Gatun lock of the Panama canal. It was assembled just as it will be when it is finally placed in operation, and demonstra-

tions of its workings were made before a number of guests, including engineers, members of the technical press and General Electric employees. Details of this apparatus, which has many points of similarity with the interlocking apparatus used on railroads, will be published later.

The B. F. Sturtevant Company of Canada, Ltd., has recently been incorporated in Canada and will build a plant at Galt, Ontario. From this plant the company will handle all business in Canada and also export to England, Australia and other foreign countries. Arrangements have been made to provide for an expansion of this plant up to ten acres. Salesmen are already located to cover the Montreal, Toronto and Vancouver sections and offices will soon be established in each principal city in Canada. This company will make and sell some of the more important lines of apparatus now handled by the B. F. Sturtevant Company, Hyde Park, Mass., including fans and blowers, planing mill exhausters, propeller fans heating and ventilating apparatus, fuel economizers, steam turbines, vertical engines, generating sets and stokers.

Manning, Maxwell & Moore, Inc., New York, together with its subsidiary companies, will move its general offices on or about October 1 from 85-89 Liberty street to the new Lewisohn building, 113-119 West Fortieth street. This change is being made to meet the demand for a more convenient and central location, as well as larger space to handle material increases in their various lines, which cover electric traveling cranes, machine tools, engineering specialties and railway, machinists', engineers', factory and contractors' supplies. A large portion of this product is manufactured by their constituent companies, the Shaw Electric Crane Company, the Ashcroft Manufacturing Company, the Consolidated Safety Valve Company, the Hayden & Derby Manufacturing Company, and the Hancock Inspirator Company. The amount of floor space in the new offices will be 28,000 sq. ft., almost double that of the present offices.

TRADE PUBLICATIONS.

WATER SOFTENERS.—The Kennicott Company, Chicago Heights, Ill., is distributing a pamphlet describing the company and its work by Elbert Hubbard.

DENVER & RIO GRANDE.—The passenger department has issued a 98-page booklet describing the attractions of outdoor life in the Rocky mountains, including descriptions of the various places and valuable suggestions for people contemplating an outdoor vacation, with estimates of the various incidental expenses.

TITANIUM ALLOY FOR OPEN HEARTH RAILS.—The Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., has prepared bulletin No. 1 of a series of rail reports which will be published from time to time, giving the results of a series of studies of rail steels both in service and in the laboratory. The present bulletin covers tests made on five sets of samples of standard open hearth and titanium treated "A" rails which were rolled by the same mills under the same specifications, the only difference being the introduction in one set of 0.1 per cent. of titanium alloy. The report of these tests includes a set of 10 sulphur prints showing segregation of the carbon, phosphorus and sulphur and a set of 16 photomicrographs showing the characteristic structure of the steel in the two sets of rails. The specimens from which some of these photomicrographs were made were etched by different treatments to show the arrangement of ferrite, cementite and pearlite. These photographs also show, of course, the phosphorus enclosures and slag fissures. The report also contains the results of mechanical analyses and physical tests of both sets of rails with a brief description of the method of taking the sample pieces and making some of the tests and a short discussion of the showing made by the treated rails. The conclusions reached in the report are that the treated rail is more ductile than standard open hearth steel without being lower in strength, that it is slightly harder, more resistant to impact, less easily broken and is superior in endurance under normal loads. The treated steel is practically homogeneous, resulting in improvement of all the physical properties, as shown by the comparative tests. The manner of presenting information which is followed in this report is highly commendable, as the best known methods of testing are employed and the company offers any railroad or steel mill official free access to the original records of the tests which are on file in its laboratory to make further investigation or verify any of the statements made.



H. G. Thompson.

Railway Construction.

AUGUSTA & EDGEFIELD (Electric).—We are told that this company plans to build from Augusta, Ga., north via North Augusta, S. C., Ropers, Edgefield, Pleasant Lane and Kirksey, to Greenwood, 55 miles, with permission to use either steam or electricity for the motive power. C. W. Requarth, Charlotte, N. C., will have charge of the survey and obtaining rights of way. It is expected that the survey will be completed this fall, when contracts for grading, track laying, bridges, etc., will be let. There will be two bridges, one over the Savannah river at Augusta, Ga., and one over Turkey creek; also terminal stations, way stations and a power plant. The principal commodities to be carried are cotton, grain, merchandise and lumber. The line will traverse a thickly settled but undeveloped farming and timber section. William P. Calhoun, chairman of the survey committee, Edgefield.

BUTTE, BOISE & WINNEMUCCA.—According to press reports construction work has started on the line of this company from Boise, northeast to Butte, to a connection with the Gilmore & Pittsburg, and from Boise southwest to Winnemucca, Nev., to a connection with the Western Pacific. The contract was awarded to J. W. Monarch.

CALIFORNIA-OREGON & EASTERN.—This company is planning to build from Grants Pass, Oregon, southwest to Crescent City, Cal., about 100 miles. William Loftus, Portland, Oregon, is president of a construction company that has been organized to build the line. The grading work is to be started at once on the first section of 10 miles from Grants Pass to Wilderville, crossing the Rogue and Applegate rivers. Franklin Helm, San Francisco, Cal., represents California capitalists backing the project. (See Grants Pass-Crescent City, April 11, p. 863.)

CANADIAN PACIFIC.—This company will build an electric line from Hamilton, Ont., to Niagara Falls. By constructing this electric line through the Niagara peninsula, the Canadian Pacific will be in a position to handle traffic direct from Hamilton to Buffalo on its own right of way, instead of operating, as at present, over the lines of the Toronto, Hamilton & Buffalo and the Michigan Central. The Canadian Pacific may undertake, also, the construction of a line from Toronto to Hamilton, to avoid operating over the Grand Trunk tracks.

CHARLOTTESVILLE INTERURBAN.—We are told that surveys have been made and the route decided upon, for a line from Charlottesville, Va., southwest about 15 miles to Alberene. Financial arrangements are not yet complete, but it is probable that the line will be built. Walter Washabaugh, Charlottesville, may be addressed.

COLORADO, KANSAS & OKLAHOMA.—An officer writes that this company intends to build from Scott City, Kan., to a connection with the Midland Valley at Wichita. The route has not yet been definitely decided upon, but the line will probably run from Scott City to Dodge City, thence to Kinsley and thence to Wichita. Preliminary surveys will be made shortly. The incorporators are Frank S. Yantis, managing receiver of the Scott City Northern, Scott City; W. C. Fordyce, E. F. Goltra, W. V. Delahunt, all of St. Louis; all officers of the Scott City Northern; Leo Monroe and C. M. Monroe, of Scott City, and James A. McClure, of Topeka, Kan.

DIXIE RAILWAY.—An officer writes that work is now under way building from Alexander City, Ala., south to Benson, 15 miles. O. J. Pruett is the contractor. Grading has been finished on seven miles, and track laying has recently been started. The work involves handling about 10,000 cu. yds. a mile. There will be one 500-ft. trestle on the line. The company expects to develop a traffic in lumber, naval stores and cotton oil products. W. E. Benson, president, and D. B. McKenzie, chief engineer, Benson. (June 13, p. 1324.)

FOX & ILLINOIS UNION (Electric).—An officer writes that the track is all laid from Yorkville, Ill., south to Morris, about 20 miles. H. H. Evans is president, with office at Aurora, Ill. F. M. Zimmerman is chief engineer.

GREAT NORTHERN.—See Kettle Valley.

KETTLE VALLEY.—According to press reports, this company, jointly with the Great Northern, will build the unfinished link across the Hope mountains from the Coquehalla summit to Hope, B. C., on the Frazer river, 60 miles. Bids will be called for immediately. The Kettle Valley will build and operate the section, both systems sharing the expense and running rights.

MATADOR & NORTHERN (Electric).—An officer writes that a contract has been given to F. Fennon, and work is now under way from a connection with the Quanah, Acme & Pacific at a point three miles east of Roaring Springs, Tex., to Matador, 9 miles, and grading work is about 25 per cent. completed. The maximum grade is 1 per cent., and maximum curvature 4 deg. There will be five trestles on the line. A. B. Echols is president, and G. A. Lider, chief engineer, Matador.

MINNEAPOLIS, ST. PAUL, ROCHESTER & DUBUQUE TRACTION.—An officer writes that a contract for grading work on eight miles has been given to Frederick & Barnard, Minneapolis, Minn., and sub-contracts have been given to Dale & Baumgardner, St. Paul, and to McCollough & Cheney, Minneapolis. The company now operates an electric line from Minneapolis, Minn., south, and plans to build an extension southwest via Rochester and Cresco, Iowa, towards Dubuque.

MISSOURI, KANSAS & TEXAS.—This company is planning to build from Whitney, Tex., to Hillsboro, on the main line, to make traffic arrangements with the Trinity & Brazos Valley from Hillsboro to Teague, to build about 65 miles from Teague to Trinity, connecting there with the branch to Livingston and to build from Livingston to Galveston via Beaumont. This will give the company a much more direct route to Galveston.

NORTHERN PACIFIC.—This company is planning to start work shortly on the Lake basin branch, which will run from Great Northern Junction, Mont., on the main line, north to Hester on the Billings & Northern, thence northwesterly past Stickley to a point north of Busteed, and east of Gibson.

PINE BLUFF & NORTHERN.—An officer of this company, which operates 8 miles of railway from McCreanor, Ark., on the Chicago, Rock Island & Pacific, south to Cullor, writes that the work is held up pending a decision of the Supreme Court of Arkansas regarding the construction of a bridge over the Arkansas river. The company started work some time ago from McCreanor south to Pine Bluff, 42 miles, and expects to develop a traffic in lumber and timber products, cotton and farm products, rice and merchandise.

SOUTHERN NEW ENGLAND.—Contractor John Marsch, who had been doing the work on this line from Palmer, Mass., to Providence, R. I., has been asked to complete his contract. The section between Palmer and Blackstone, 58 miles, will be built first, as the construction of that section would take about 18 months. Construction work will not be resumed in Rhode Island until the Massachusetts section is well under way. It is understood that Mr. Marsch is ready to resume work upon a guarantee of reimbursement for such damages as he suffered on account of the previous interruption.

VAN HORN VALLEY.—Organized in Texas, with headquarters at Van Horn, to build from Lobo, Tex., on the Southern Pacific to a connection with either the El Paso & Southwestern or the Atchison, Topeka & Santa Fe at some point in New Mexico, over 200 miles. The incorporators include R. H. Owen, F. J. Cumming, J. E. Hayes and A. M. Lewis, all of Minneapolis, Minn.; J. Y. Canon and J. M. Daugherty, Van Horn; J. McGregor, Lobo.

WABASH.—This company has just completed and put into service a set of new double tracks between Bement, Ill., and Monticello, 10 miles. This road will soon have double track from St. Louis to Lodge, 150 miles, on the line to Chicago. The second track being built from St. Louis to the Indiana State line, 200 miles, is also near completion.

WESTERN MARYLAND.—Construction work will be begun at once on a branch from a point near Henry, W. Va., to Kempton, about 3 miles. This branch will be known as the Kempton branch, and will serve a new coal mine of the Davis Coal & Coke Company. The contract for the construction of the line has been awarded to A. L. Anderson & Brothers, Altoona, Pa.

RAILWAY STRUCTURES.

ASHTABULA, OHIO.—The Lake Shore & Michigan Southern will open bids next week for the car shop which is to be built at this point. The shop will be 200 ft. x 450 ft. and will cost about \$40,000.

BROWNWOOD, TEX.—The Gulf, Colorado & Santa Fe has let contracts to H. D. McCoy, of Cleburne, for a 12-stall brick and concrete roundhouse, a machine shop 60 x 80 ft., and a power house 37 by 80 ft.

CUMBERLAND, MD.—The Western Maryland has completed the construction of a roundhouse, a power plant, a machine shop and engine terminals at Maryland Junction, near Cumberland. The roundhouse has 20 stalls and is of steel and concrete construction. The contract for furnishing the structural steel for this building was awarded to the McClintic-Marshall Construction Company. The machine shop is equipped for light repairs to engines and cars but particularly to engines. The engine terminals will be of sufficient size to meet the needs of the company at that point. These improvements are a part of the general terminal development at Cumberland. A new passenger and freight station has recently been completed at that point by this road.

DENVER, COLO.—Plans have been prepared by the engineers for the proposed remodeling of the Denver union station, together with track elevation and improvements, which will bring the cost up to about \$2,000,000.

DURANT, OKLAHOMA.—A new Union station will be built at this point by the Missouri, Kansas & Texas, the St. Louis & San Francisco and the Missouri, Oklahoma & Gulf jointly. It will cost about \$60,000.

MEXIA, TEX.—The Houston & Texas Central has purchased a tract of 260 acres near Mexia, on which will be erected a 12-stall roundhouse, car sheds and shops to handle running repairs. Plans for the improvement are now being prepared by the engineering department.

PADUCAH, KENTUCKY.—The Illinois Central will double the capacity of its shops at this point. Details are not yet available, but new buildings will be erected and new machinery installed.

ROCHESTER, N. Y.—The New York Central & Hudson River is building four bridges at Rochester over Hudson, Chatham, Joseph and Clinton street or avenues. These bridges will have solid floors and the subways will be of steel. About 2,500 tons of structural steel will be required. Contracts have been let as follows: For the foundation, Goosline & Swan, Rochester, N. Y.; for fabricating structure, McClintic-Marshall Construction Company, Pottstown, Pa.; for erection, Jobson-Gifford Company, New York. Membrane waterproofing, made by the H. W. Johns-Manville Company, New York, will be used.

UTICA, N. Y.—The New York Central & Hudson River is building a new passenger station at this point. J. Henry Miller, Inc., Baltimore, Md., is the general contractor for the passenger station proper, and Henry R. Beebe, Utica, is the contractor for the passenger and baggage subways. This company has just completed the construction of a thirty-stall engine house at Utica.

NORTHERN CENTRAL RAILWAY, COLOMBIA.—Construction work on this line has been stopped. There are few parts of South America which offer greater physical drawbacks than this portion of Colombia. The line was commenced from the swampy and desolate banks of the Magdalena river, at a dismal fever and mosquito-haunted place called Puerto Wilches. It was intended to carry the railway through the forests, across mountains and over torrential rivers and streams until it reached Bucaramanga, the center of a rich and thriving agricultural and mining district in the heart of Colombia, hitherto entirely without any other means of transportation than the mule or donkey. Upon the construction of this new route some of the most skillful and enterprising railway engineers of the day have been engaged, and in few parts of South America would it be possible to find better examples of railway track-laying, more admirably constructed bridges, stronger earthworks and retaining walls, or, indeed, a more conscientiously built line from start to finish. A difficulty about the government guarantee threatens to ruin the entire enterprise.

Railway Financial News.

BUFFALO, ROCHESTER & PITTSBURGH.—Kean, Taylor & Company, New York, have bought from this company \$500,000 series G 4 per cent. equipment trust bonds.

CINCINNATI, HAMILTON & DAYTON.—The Public Service Commission of Ohio has granted permission to this company to issue \$787,000 first and refunding unguaranteed 4½ per cent. bonds as security for a loan, the amount of which is to be not less than 80 per cent. of the face value of the bonds.

ILLINOIS CENTRAL.—The directors have declared a semi-annual dividend of 2½ per cent., thus reducing the annual rate from 7 to 5 per cent. The company has been paying 7 per cent. since 1905. The Union Pacific owns directly and indirectly \$31,700,000 Illinois Central stock.

SEABOARD AIR LINE.—This company has sold \$1,900,000 5 per cent. equipment trust notes to the Equitable Trust Company, Kean, Taylor & Company, and Eastman, Dillon & Company, all of New York. The company is paying 15 per cent. in cash for the equipment which is to be security for the notes.

SOUTHERN PACIFIC.—See an item in Court News in regard to this company.

UNION PACIFIC.—In a note accompanying the preliminary statement of the income account for the year ended June 30, 1913, C. B. Seger, vice-president in charge of accounting, explains that while the estimated surplus of \$32,616,465, after the payment of 4 per cent. dividends on the preferred stock, is \$2,558,216 greater than at the end of 1912, and in 1913 is equivalent to 15.06 per cent. on the total outstanding common stock, the 1913 surplus does not include the fourth quarterly dividend on Southern Pacific stock, payable October 1, 1913, amounting to \$1,899,750, although the corresponding dividend for the preceding year, paid on October 1, 1912, is included in the surplus for the year ended June 30, 1912.

The first quarterly dividend on the Southern Pacific Company stock, payable January 1, 1913, was collected on the full amount of 1,266,500 shares [\$126,650,000]. The second and third quarterly dividends, payable on April 1 and July 1, 1913, have been collected on the 382,924 shares [\$38,292,400] (this brings the amount of stock sold to the Pennsylvania); while on the remaining \$88,357,600 stock the dividend has been collected by the Central Trust Company of New York, and such dividends will be received in connection with the offer now pending to Union Pacific stockholders of subscription rights to certificates of interest representing the Southern Pacific stock, and the amount is therefore included in income from investments in 1913 income account.

See also Illinois Central.

WABASH.—Judge Sessions has authorized the receivers to issue \$14,000,000 6 per cent. receivers' certificates to provide for maturing receivers' certificates which were issued February 1, 1912.

BANGKOK-SINGAPORE RAILWAY.—The British and the Siamese governments are considering a proposal to run the Bangkok-Singapore Railway down the west coast of the Malay peninsula, so as to pass through Kedah and the province of Wellesley and bring Penang within a few days of Bangkok and giving a much quicker mail route to Siam. It was originally intended to run the railway down the east coast, passing through Kelantan and Pahang, and so missing Penang. If this proposal is sanctioned it will mean considerable acceleration in finishing a route direct from Bangkok to Singapore, as the work of constructing the extension from the Federated Malay States Railway main line at Bukit Mutajam in the province of Wellesley to Alor Star, the chief town and capital of Kedah, is well in hand, and it is proposed to extend the line still further to the state of Pulis, of which Kangka is the chief town. The distance from Bukit Mutajam to Alor Star is, roughly, 65 miles, and from Alor Star to Kangka 30 miles, making a total distance of nearly 100 miles, of which part is already constructed and surveyed. This construction work will be carried out by the construction department of the Federated Malay States Railways. The Siamese portion will be constructed by the Siamese Royal State Railways.